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REPORT

OF THE

Twenty-Fourth Annual Meeting

OF THE

American  
Street Railway Association

HELD AT THE

PHILADELPHIA MUSEUM  
PHILADELPHIA, PA.

September 27-28, 1905

HON. W. CARYL ELY

President Ohio Valley Finance Co., Buffalo, N. Y.

PRESIDENT

Association Organized December 13, 1882

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1905-1906

---

OFFICE OF THE AMERICAN STREET & INTERURBAN RY. ASSOCIATION

60 WALL STREET, NEW YORK

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W Langley.

PRESIDENT 1904-1905

HON. W. CARYL ELY, PRESIDENT

OHIO VALLEY FINANCE CO.

**BUFFALO, N. Y.**



R E P O R T

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60 WALL STREET, NEW YORK

This Association is now the  
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**OFFICERS, 1905-1906**  
(American Street and Interurban Railway Association)

PRESIDENT:

**HON. W. CARYL ELY**

President Ohio Valley Finance Co.  
BUFFALO, NEW YORK

FIRST VICE-PRESIDENT:

**JOHN I. BEGGS**

President Milwaukee Electric Railway & Light Co.  
President United Railways of St. Louis  
MILWAUKEE, WIS.

SECOND VICE-PRESIDENT:

**CALVIN G. GOODRICH**

Vice-President Twin City Rapid Transit Co.  
MINNEAPOLIS, MINN.

THIRD VICE-PRESIDENT

**JAMES F. SHAW**

President Boston & Worcester Electric Cos.  
BOSTON, MASS.

SECRETARY AND TREASURER

**BERNARD V. SWENSON**  
60 Wall Street  
NEW YORK, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND

W. B. BROCKWAY, Auditor Nashville, (Tenn.) Railway and  
Light Co. Yonkers, N. Y.  
President, American Street and Interurban Railway Ac-  
countants' Association.

H. H. ADAMS, Superintendent of Shops, The United Railways  
& Electric Co. Baltimore, Md.  
President, American Street and Interurban Railway En-  
gineering Association.

S. L. RHOADES, General Claim Agent, Philadelphia Rapid Tran-  
sit Co. Philadelphia, Pa.  
President, American Street and Interurban Railway  
Claim Agents' Association.

PLACE OF MEETING TO BE SELECTED BY THE  
EXECUTIVE COMMITTEE.

## OFFICERS, ORGANIZATION.

CHAIRMAN:

**MOODY MERRILL,**

*President, Highland Street Railway Company, Boston, Mass.*

SECRETARIES:

**CHAUNCEY C. WOODWORTH,**

*Secretary, Rochester City and Brighton Railroad Company, Rochester, N. Y.*

**CHARLES B. CLEGG,**

*President, Oakwood and Dayton Street Railway Companies, Dayton, O.*

PLACE OF MEETING, BOSTON, MASS.

---

## OFFICERS SINCE ORGANIZATION.

### OFFICERS, 1882-'83.

PRESIDENT:

**H. H. LITTELL,**

*General Manager, Louisville City Railway Company, Louisville, Ky.*

FIRST VICE-PRESIDENT:

**WILLIAM H. HAZZARD,**

*President, Brooklyn City Railroad Company, Brooklyn, N. Y.*

SECOND VICE-PRESIDENT:

**CALVIN A. RICHARDS,**

*President, Metropolitan Railroad Company, Boston, Mass.*

THIRD VICE-PRESIDENT:

**GEORGE B. KERPER,**

*President, Mount Adams and Eden Park Inclined Railway, Cincinnati, O.*

SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

JULIUS S. WALSH, Pres., Citizens' Railway Co., St. Louis, Mo.

CHARLES CLEMINSHAW, Vice-Pres., Troy and Lansingburgh Railroad Co., Troy, N. Y.

THOMAS LOWRY, Pres., Minneapolis Street Railway Co., Minneapolis, Minn.

JAMES K. LAKE, Supt., Chicago West Division Railway, Chicago, Ill.

DANIEL F. LONGSTREET, Gen. Man., Union Railroad Co., Providence, R. I.

PLACE OF MEETING, CHICAGO, ILL.

### OFFICERS, 1883-'84.

PRESIDENT:

**WILLIAM H. HAZZARD,**

*President, Brooklyn City Railroad Company, Brooklyn, N. Y.*

FIRST VICE-PRESIDENT:

**JAMES K. LAKE,**

*Superintendent, Chicago West Division Railway, Chicago, Ill.*

SECOND VICE-PRESIDENT:

**GEORGE B. KERPER,**

*President, Mt. Adams and Eden Park Inclined Railway, Cincinnati, O.*

THIRD VICE-PRESIDENT:

**DANIEL F. LONGSTREET,**

*General Manager, Union Railroad Co., Providence, R. I.*

SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

H. H. LITTELL, Gen. Man., Louisville City Railway Co., Louisville, Ky.

JOHN G. HOLMES, Pres., Citizens' Street Railroad Co., Pittsburgh, Pa.

JULIUS E. RUGG, Supt., Highland Street Railroad, Boston, Mass.

PIERRE C. MAFFITT, Pres., Missouri Railroad Co., St. Louis, Mo.

JACOB SHARP, Pres., Twenty-third Street Railway Co., New York, N. Y.

PLACE OF MEETING, NEW YORK, N. Y.

## OFFICERS, 1884-'85.

### PRESIDENT:

**CALVIN A. RICHARDS,**

*President, Metropolitan Railroad Company, Boston, Mass.*

### FIRST VICE-PRESIDENT:

**JULIUS S. WALSH,**

*President, Citizens' Railway Company, St. Louis, Mo.*

### SECOND VICE-PRESIDENT:

**HENRY M. WATSON,**

*President, Buffalo Street Railroad Company, Buffalo, N. Y.*

### THIRD VICE-PRESIDENT:

**EDWARD LUSHER,**

*Sec. and Treas., Montreal City Passenger Railway Company, Montreal, Can.*

### SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

WILLIAM H. HAZZARD, Pres., Brooklyn City Railroad Co., Brooklyn, N. Y.

JAMES K. LAKE, Supt., Chicago West Division Railway, Chicago, Ill.

CHARLES J. HARRAH, Pres., People's Passenger Railway Co., Philadelphia, Pa.

WILLIAM WHITE, Pres., Dry Dock, E. Broadway & B. Railroad Co., New York, N. Y.

B. DU PONT, Pres., Central Passenger Railroad Co., Louisville, Ky.

PLACE OF MEETING, ST. LOUIS, MO.

## OFFICERS, 1885-'86.

### PRESIDENT:

**JULIUS S. WALSH,**

*President, Citizens' Railway Company, St. Louis, Mo.*

### FIRST VICE-PRESIDENT:

**WILLIAM WHITE,**

*President, Dry Dock, E. Broadway & B. Railroad Company, New York, N. Y.*

### SECOND VICE-PRESIDENT:

**CHARLES B. HOLMES,**

*President, Chicago City Railway Company, Chicago, Ill.*

### THIRD VICE-PRESIDENT:

**SAMUEL LITTLE,**

*Treasurer, Highland Street Railway Company, Boston, Mass.*

### SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

CALVIN A. RICHARDS, Pres., Metropolitan Railroad Co., Boston, Mass.

JOHN KILGOUR, Pres., Cincinnati Street Railway Co., Cincinnati, O.

JOHN MAGUIRE, Pres., City Railroad Co., Mobile, Ala.

THOMAS W. ACKLEY, Pres., 13th and 15th Streets Pass. Railway Co., Philadelphia, Pa.

CHAUNCEY C. WOODWORTH, Sec., Rochester City & B. Railroad Co., Rochester, N. Y.

PLACE OF MEETING, CINCINNATI, O.

## OFFICERS, 1886-'87.

### PRESIDENT:

**THOMAS W. ACKLEY,**

*President, 13th and 15th Streets Passenger Railway Company, Philadelphia, Pa.*

### FIRST VICE-PRESIDENT:

**ALBERT G. CLARK,**

*Vice-President, Cincinnati Street Railway Company, Cincinnati, O.*

### SECOND VICE-PRESIDENT:

**WILLIAM H. SINCLAIR,**

*President, Galveston City Railroad Company, Galveston, Tex.*

### THIRD VICE-PRESIDENT:

**PRENTISS CUMMINGS,**

*President, Cambridge Railroad Company, Cambridge, Mass.*

### SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

JULIUS S. WALSH, Pres., Citizens' Railway Co., St. Louis, Mo.

HENRY HURT, Pres., Washington and Georgetown Railroad Co., Washington, D. C.

C. DENSMORE WYMAN, Vice-Pres., Central Park, N. & E. River Railroad Co., N. Y.

A. EVERETT, Pres., East Cleveland Railroad Co., Cleveland, O.

SAMUEL S. SPAULDING, Pres., East Side Street Railroad Co., Buffalo, N. Y.

PLACE OF MEETING, PHILADELPHIA, PA.

## OFFICERS, 1887-'88.

### PRESIDENT:

**CHARLES B. HOLMES,**

*President, Chicago City Railway Company, Chicago, Ill.*

### FIRST VICE-PRESIDENT:

**JULIUS E. RUGG,**

*General Superintendent, Boston Consolidated Street Railway, Boston, Mass.*

### SECOND VICE-PRESIDENT:

**R. DUDLEY FRAYER,**

*President, Memphis City Railway Company, Memphis, Tenn.*

### THIRD VICE-PRESIDENT:

**CHARLES B. CLEGG,**

*Director, Dayton Street Railroad Company, Dayton, O.*

### SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

THOMAS W. ACKLEY, Pres., 13th and 15th Streets Pass. Railway Co., Philadelphia, Pa.

WINFIELD SMITH, Pres., Cream City Railroad Co., Milwaukee, Wis.

DANIEL F. LEWIS, Pres., Brooklyn City Railroad Co., Brooklyn, N. Y.

CHARLES GREEN, Pres., People's Railway Co., St. Louis, Mo.

EDWARD G. MOSHER, Supt., Augusta and Summerville Railroad, Augusta, Ga.

### PLACE OF MEETING, WASHINGTON, D. C.

## OFFICERS, 1888-'89.

### PRESIDENT:

**GEORGE B. KERPER,**

*President, Mount Adams and Eden Park Inclined Railway, Cincinnati, O.*

### FIRST VICE-PRESIDENT:

**JESSE MFTCALF,**

*President, Union Railroad Company, Providence, R. I.*

### SECOND VICE-PRESIDENT:

**HENRY HURT,**

*President, Washington and Georgetown Railroad Company, Washington, D. C.*

### THIRD VICE-PRESIDENT:

**WILLIAM H. MARTIN,**

*Vice-President, Ferries and Cliff House Railway Company, San Francisco, Cal.*

### SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

CHARLES B. HOLMES, Pres., Chicago City Railway Co., Chicago, Ill.

JOHN SCULLIN, Pres., Union Depot Railroad Co., St. Louis, Mo.

JAMES H. JOHNSTON, Pres., City and Suburban Railway Co., Savannah, Ga.

HENRY A. SAGE, Pres., Easton, S. Easton & W. E. Pass. Railway Co., Easton, Pa.

EDWARD J. LAWLESS, Supt., Metropolitan Street Railway, Kansas City, Mo.

### PLACE OF MEETING, MINNEAPOLIS, MINN.

## OFFICERS, 1889-'90.

### PRESIDENT:

**THOMAS LOWRY,**

*President, Minneapolis, and St. Paul, Street Railway Companies, Minneapolis, Minn.*

### FIRST VICE-PRESIDENT:

**C. DENSMORE WYMAN,**

*Vice-President, Central Park, North and East River Railroad Company, New York, N. Y.*

### SECOND VICE-PRESIDENT:

**JOHN C. SHAFFER,**

*President, Citizens' Street Railroad Company, Indianapolis, Ind.*

### THIRD VICE-PRESIDENT:

**ROBERT McCULLOCH,**

*General Manager, Citizens', St. Louis, Cass Avenue & Fair Grounds, and Benton-Belle-Fontaine Railways, St. Louis, Mo.*

### SECRETARY AND TREASURER:

**WILLIAM J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

GEORGE B. KERPER, Pres., Mt. Adams and E. P. Inc. Railway Co., Cincinnati, O.

GEORGE W. KIELY, Man. Dir., Toronto Street Railway Co., Toronto, Canada.

FRANK H. MONKS, Gen. Man., West End Street Railway Co., Boston, Mass.

RAPHAELE SEMMES, Supt., Citizens' Street Railroad, Memphis, Tenn.

FRANCIS M. EPPLEY, Pres., Orange Cross-Town & B. Railway Co., Orange, N. J.

### PLACE OF MEETING, BUFFALO, N. Y.

## OFFICERS, 1890-'91.

### PRESIDENT:

**HENRY M. WATSON,**

*President, Buffalo Street Railroad, and Buffalo East Side Street Railway, Companies, Buffalo, N. Y.*

### FIRST VICE-PRESIDENT:

**WILLIAM A. SMITH,**

*General Manager, Omaha Street Railway Company, Omaha, Neb.*

### THIRD VICE-PRESIDENT:

**ANDREW D. RODGERS,**

*President, Columbus Consolidated Street Railroad Company, Columbus, O.*

### SECOND VICE-PRESIDENT:

**CHARLES ODELL,**

*President, Newburyport & Amesbury Street Railroad Company, Newburyport, Mass.*

### SECRETARY AND TREASURER:

**W. M. J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and

THOMAS LOWRY, Pres., Minneapolis and St. Paul Street R'y Co's., Minneapolis, Minn.

DAVID F. HENRY, Pres., Federal Street and P. V. Pass Railway Co., Pittsburg, Pa.

ALBERT E. THORNTON, Dir., Atlanta Street Railroad Co., Atlanta, Ga.

HARVEY M. LITTELL, Gen. Man., Cincinnati Inclined Plane R'y Co., Cincinnati, O.

THOMAS C. KEEFER, Pres., Ottawa City Pass Railway Co., Ottawa, Canada.

PLACE OF MEETING, PITTSBURG, PA.

## OFFICERS, 1891-'92.

### PRESIDENT:

**JOHN G. HOLMES,**

*President, Citizens' Traction Company, Pittsburgh, Pa.*

### FIRST VICE-PRESIDENT:

**THOMAS H. MCLEAN,**

*Secretary, Twenty-third Street Railway Company, New York, N. Y.*

### SECOND VICE-PRESIDENT:

**JAMES B. SPEED.**

*President, Louisville City Railway Company, Louisville, Ky.*

### THIRD VICE-PRESIDENT:

**ALBION E. LANG.**

*Vice-President, Toledo Consolidated Street Railway Company, Toledo, O.*

### SECRETARY AND TREASURER:

**W. M. J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE PRESIDENTS and

"

HENRY M. WATSON, Pres., Buffalo Railway Co., Buffalo, N. Y.

LEWIS PERRINE, JR., Pres., Trenton Pass, Railway Co., Consolidated, Trenton, N. J.

W. WORTH BEAN, Pres., St. Joseph and Benton Harbor R'y Co., St. Joseph, Mich.

MURRY A. VERNER, Pres., Pittsburgh and Birmingham Traction Co., Pittsburgh, Pa.

THOMAS C. PENINGTON, Treas., Chicago City Railway Co., Chicago.

PLACE OF MEETING, CLEVELAND, O.

## OFFICERS, 1892-'93.

### PRESIDENT:

**D. F. LONGSTREET,**

*Vice-Pres. and Gen. Man., West End Street Railroad Company, Denver, Col.*

### FIRST VICE-PRESIDENT:

**A. EVERETT,**

*President, East Cleveland Railroad Company, Cleveland, O.*

### THIRD VICE-PRESIDENT:

**W. WORTH BEAN,**

*President, St. Joseph & Benton Harbor Electric Ry. Co., St. Joseph, Mich.*

### SECOND VICE-PRESIDENT:

**JOEL HURT,**

*President, Atlanta Consolidated Street Sec. and Treas., Atlantic Avenue Railroad Company, Atlanta, Ga.*

### SECRETARY AND TREASURER:

**W. M. J. RICHARDSON,**

*Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND

JOHN G. HOLMES, Pres., Citizens' Traction Co., Pittsburgh, Pa.

JOHN D. CRIMMINS, Pres., Metropolitan Traction Co., New York, N. Y.

THOMAS J. MINARY, Gen. Man., Louisville Railway Co., Louisville, Ky.

JAMES R. CHAPMAN, Vice-Pres., Consolidated St. Railway Co., Grand Rapids, Mich.

BENJAMIN E. CHARLTON, Pres., Hamilton Street Railway Co., Hamilton, Ont.

PLACE OF MEETING, MILWAUKEE, WIS.

## OFFICERS, 1893-'94.

### PRESIDENT:

**HENRY C. PAYNE,**

*Vice-President, Milwaukee Street Railway Company, Milwaukee, Wis.*

### FIRST VICE-PRESIDENT:

**WILLIAM J. STEPHENSON,**

*President, Metropolitan Railroad Company, Washington, D. C.*

### SECOND VICE-PRESIDENT:

**JAMES R. CHAPMAN,**

*Vice-President, Consolidated Street Railway Company, Grand Rapids, Mich.*

### THIRD VICE-PRESIDENT:

**LEWIS PERRINE, JR.,**

*President, Trenton Passenger Railway Company, Consolidated, Trenton, N. J.*

### SECRETARY AND TREASURER:

**WM. J. RICHARDSON,**

*Sec. and Treas., Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

D. F. LONGSTREET, Vice-Pres., West End Street Railway Co., Denver, Col.  
THOMAS H. MCLEAN, Gen. Man., Citizens' Street Railroad Co., Indianapolis, Ind.  
EDWARDS WHITAKER, Pres., Lindell Railway Co., St. Louis, Mo.  
W. Y. SOPER, Pres., Ottawa Electric Street Railway Co., Ottawa, Can.  
E. S. GOODRICH, Pres., Hartford Street Railway Co., Hartford, Conn.

## PLACE OF MEETING, ATLANTA, GA.

## OFFICERS, 1894-'95.

### PRESIDENT:

**JOEL HURT,**

*President, Atlanta Consolidated Street Railway Company, Atlanta, Ga.*

### FIRST VICE-PRESIDENT:

**W. WORTH BEAN,**

*Pres., St. Joseph & Benton Harbor Electric Railway and Light Co., St. Joseph, Mich.*

### THIRD VICE-PRESIDENT:

**RUSSELL B. HARRISON,**

*Pres., Terre Haute Street Railway Company, Terre Haute, Ind.*

### SECOND VICE-PRESIDENT:

**JOHN H. CUNNINGHAM,**

*Director, Lynn and Boston Railroad Company, Boston, Mass.*

### SECRETARY AND TREASURER:

**WM. JAMES RICHARDSON,**

*Director, Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

HENRY C. PAYNE, Vice Pres., Milwaukee Street Railway Co., Milwaukee, Wis.

WILLIAM H. JACKSON, Pres., Nashville Street Railway, Nashville, Tenn.

D. G. HAMILTON, Pres., Cass Ave. and Fair Grounds Ry. Co. and St. Louis R. R. Co., St. Louis, Mo.

GRANVILLE C. CUNNINGHAM, Man., Montreal Street Railway Co., Montreal, Can.

JOHN N. PARTRIDGE, Pres., Brooklyn City & Newtown Railroad Co., Brooklyn, N. Y.

## PLACE OF MEETING, MONTREAL, CANADA.

## OFFICERS, 1895-'96.

### PRESIDENT:

**H. M. LITTELL,**

*Pres. Atlantic Avenue Railroad Company, Brooklyn, N. Y.*

### FIRST VICE-PRESIDENT:

**GRANVILLE C. CUNNINGHAM,** Pres. **J. WILLARD MORGAN,**  
*Man. Montreal Street Railway Company, Pres. Camden, Gloucester and Woodbury*  
*Montreal, Can. Railroad Company, Camden, N. J.*

### THIRD VICE-PRESIDENT:

### SECOND VICE-PRESIDENT,

**WILLIAM H. JACKSON,**

*Pres. Nashville Street Railway, Pres. Chicago City Railway Co.,  
Nashville, Tenn. Chicago, Ill.*

### SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co., Chicago, Ill.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

JOEL HURT, Pres. Atlanta Consolidated Street Railway Co., Atlanta, Ga.

PRENTISS CUMMINGS, Vice-Pres. West End Street Railway Co., Boston, Mass.

C. G. GOODRICH, Vice-Pres. Twin City Railway Co., St. Paul, Minn.

A. MARKLE, Gen. Man. Lehigh Traction Co., Hazleton, Pa.

W. F. KELLY, Gen. Man. Columbus Street Railway Co., Columbus, Ohio.

## PLACE OF MEETING, ST. LOUIS, MO.

## OFFICERS, 1896-'97.

### PRESIDENT:

**ROBERT McCULLOCH,**

*Vice-Pres. and Gen. Man. Citizens', Cass Avenue and St. Louis Railroad Companies,  
St. Louis, Mo.*

### FIRST VICE-PRESIDENT:

**CHARLES S. SERGEANT,**

*Gen. Man. West End Street Railway Co.,  
Boston, Mass.*

### SECOND VICE-PRESIDENT:

**D. B. DYER,**

*Pres. Augusta Railway and Electric Co.,  
Augusta, Ga.*

### THIRD VICE-PRESIDENT:

**C. F. HOLMES,**

*Gen. Man. Metropolitan Street Railway  
Co., Kansas City, Mo.*

### SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treas. Chicago City Railway Co.,  
Chicago, Ill.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

H. M. LITTELL, Vice-Pres. and Gen. Man. Metropolitan St. Ry. Co., New York City.

H. P. BRADFORD, Gen. Man. Cincinnati Inclined Plane Railway Co., Cincinnati, Ohio.

CHARLES H. SMITH, Gen. Supt. Troy City Rai way Co., Troy, N. Y.

HARRY SCULLIN, Vice-Pres. and Gen. Man. Union Depot Railroad Co., St. Louis, Mo.

GEORGE B. HIPPEE, Gen. Man. Des Moines City Railway Co., Des Moines, Iowa

PLACE OF MEETING, NIAGARA FALLS, N. Y.

## OFFICERS, 1897-'98.

### PRESIDENT:

**ALBION E. LANG,**

*President Toledo Traction Co., Toledo, Ohio*

### FIRST VICE-PRESIDENT:

**W. CARY ELY,**

*President Buffalo and Niagara Falls  
Electric Ry. Co., Niagara Falls, N. Y.*

### THIRD VICE-PRESIDENT:

**EDWARD G. CONNETTE,**

*Gen. Man. Nashville Street Railway  
Nashville, Tenn.*

### SECOND VICE-PRESIDENT:

**JOHN A. RIGG,**

*President United Traction Co.,  
Reading, Pa.*

### SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co.,  
Chicago, Ill.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

ROBERT McCULLOCH, Vice-President and Gen. Man. Citizens', Cass Ave. and St. Louis  
R. R. Companies, St. Louis, Mo.

C. DENSMORE WYMAN, Gen. Man. New Orleans Traction Co., Ltd., New Orleans, La.

HENRY C. MOORE, President Trenton Street Railway Co., Trenton, N. J.

JOHN M. ROACH, Vice-President and Gen. Man. North Chicago Street Railroad Co.,

Chicago, Ill.

ROBERT S. GOFF, President and Gen. Man. Globe Street Railway Co., Fall River, Mass

PLACE OF MEETING, BOSTON, MASS.

## OFFICERS, 1898-'99.

### PRESIDENT:

**CHARLES S. SERGEANT,**

*Second Vice-President Boston Elevated Railway Co., Boston, Mass.*

### FIRST VICE-PRESIDENT:

**HENRY C. MOORE,**

*President Trenton Street Railway Co.,  
Trenton, N. J.*

### THIRD VICE-PRESIDENT:

**WALTON H. HOLMES,**

*Vice-Pres. and Gen. Man. Metropolitan  
Street Railway Co., Kansas City, Mo.*

### SECOND VICE-PRESIDENT:

**ERNEST WOODRUFF,**

*Pres. Atlanta Consolidated Street Railway  
Co., Atlanta, Ga.*

### SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treas. Chicago City Railway Co.,  
Chicago, Ill.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

ALBION E. LANG, President Toledo Traction Co., Toledo, Ohio.

GEORGE A. YUILE, Second Vice-Pres. West Chicago Street Railroad Co., Chicago, Ill.

FRANK G. JONES, Vice-President Memphis Street Railway Co., Memphis, Tenn.

JOHN I. BEGGS, Gen. Man. Milwaukee Electric Railway and Light Co., Milwaukee, Wis.

IRIA A. McCORMACK, Gen. Supt. Brooklyn Heights Railroad Co., New York, N. Y.

PLACE OF MEETING, CHICAGO, ILL.

## OFFICERS, 1899-1900.

### PRESIDENT:

**JOHN M. ROACH.**

*President Chicago Union Traction Co., Chicago, Ill.*

### FIRST VICE-PRESIDENT:

**JOHN A. RIGG,**

*President United Traction Co.,  
Reading, Pa.*

### THIRD VICE-PRESIDENT:

**FRANK G. JONES,**

*Vice-President Memphis Street Railway Co.,  
Memphis, Tenn.*

### SECOND VICE-PRESIDENT:

**HERBERT H. VREELAND,**

*President Metropolitan Street Railway Co.,  
New York, N. Y.*

### SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co.,  
Chicago, Ill.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

CHARLES S. SERGEANT, Second Vice-President Boston Elevated Railway Co., Boston, Mass.  
CHARLES K. DURBIN, General Superintendent Denver City Tramway Co., Denver, Colo.  
NICHOLAS S. HILL, Jr., General Manager Charleston Consolidated Gas and Electric Co.,  
Charleston, S. C.

CHARLES W. WASON, President Cleveland, Painesville & Eastern Railway Co., Cleveland, O.  
JOHN R. GRAHAM, President Quincy and Boston Street Railway Co., Quincy, Mass.

PLACE OF MEETING, KANSAS CITY, MO.

## OFFICERS, 1900-1901.

### PRESIDENT:

**WALTON H. HOLMES,**

*President Metropolitan Street Railway Co., Kansas City, Mo.*

### FIRST VICE-PRESIDENT:

**HERBERT H. VREELAND,**

*President Metropolitan Street Railway Co.,  
New York, N. Y.*

### SECOND VICE-PRESIDENT:

**N. H. HEFT,**

*President Meriden Electric Railroad Co.,  
Meriden, Conn.*

### THIRD VICE-PRESIDENT:

**JOHN B. MCCLARY**

*General Manager Birmingham Railway, Light  
and Power Co., Birmingham, Ala.*

### SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co.,  
Chicago, Ill.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

JOHN M. ROACH, President Chicago Union Traction Co., Chicago, Ill.  
FRANK L. FULLER, General Manager Wilkes-Barre and Wyoming Valley Traction Co.,  
Wilkes-Barre, Pa.

GEORGE W. BAUMHOFF, General Manager St. Louis Transit Co., St. Louis, Mo.

JOHN R. GRAHAM, President Brockton Street Railway Co., Brockton, Mass.

JOHN HARRIS, Superintendent Cincinnati Street Railway Co., Cincinnati, O.

PLACE OF MEETING, NEW YORK, N. Y.

## OFFICERS, 1901-1902.

### PRESIDENT:

**HERBERT H. VREELAND,**

*President Metropolitan Street Railway Co., New York, N. Y.*

### FIRST VICE-PRESIDENT:

**CHARLES W. WASON,**

*President Cleveland, Painesville and  
Eastern Railroad Co., Cleveland, O.*

### SECOND VICE-PRESIDENT:

**ELWIN C. FOSTER,**

*Vice-President Boston and Northern  
Street Railway Co., Boston, Mass.*

### THIRD VICE-PRESIDENT:

**H. M. SLOAN,**

*General Manager Calumet Electric Street  
Railway Co., Chicago, Ill.*

### SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co.,  
Chicago, Ill.*

### EXECUTIVE COMMITTEE:

#### PRESIDENT, VICE-PRESIDENTS AND

WALTON H. HOLMES, President Metropolitan Street Railway Co., Kansas City, Mo.

JOHN A. RIGG, President United Traction Co., Reading, Pa.

DANIEL B. DYER, President Augusta Railway and Electric Co., Augusta, Ga.

T. J. NICHOLL, Vice-President Rochester Railway Co., Rochester, N. Y.

GEORGE W. DICKINSON, Vice-President Seattle Electric Co., Seattle, Wash.

PLACE OF MEETING, DETROIT, MICH.

## OFFICERS, 1902-1903.

PRESIDENT:

**JERE C. HUTCHINS,**

*President Detroit United Railway, Detroit, Mich.*

FIRST VICE-PRESIDENT:

**W. CARYL ELY,**

*President International Railway Co.,  
Buffalo, N. Y.*

SECOND VICE-PRESIDENT:

**W. KELSEY SCHOEPF,**

*President Cincinnati Traction Co.,  
Cincinnati, O.*

THIRD VICE-PRESIDENT:

**P. S. ARKWRIGHT,**

*President Georgia Railway and Elec-  
tric Co., Atlanta, Ga.*

SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co.,  
Chicago, Ill.*

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND

HERBERT H. VREELAND, President Interurban Street Railway Co., New York, N. Y.

RICHARD T. LAFFIN, General Manager Worcester Consolidated Street Railway Co., Wor-

cester, Mass.

ANDREW RADEL, Vice-President Middlesex and Somerset Traction Co., Bridgeport, Conn.

WALTER P. READ, Vice-President Consolidated Railway and Power Co., Salt Lake

City, Utah.

WILLARD J. HIELD, General Manager Twin City Rapid Transit Co., Minneapolis, Minn.

PLACE OF MEETING, SARATOGA SPRINGS, N. Y.

## OFFICERS, 1903-1904.

PRESIDENT:

**W. CARYL ELY,**

*President International Railway Co., Buffalo, N. Y.*

FIRST VICE-PRESIDENT:

**ELWIN C. FOSTER,**

*President New Orleans Railways Co.,  
New Orleans, La.*

SECOND VICE-PRESIDENT:

**JOHN GRANT,**

*General Superintendent St. Louis  
Transit Co., St. Louis, Mo.*

THIRD VICE-PRESIDENT:

**JAMES F. SHAW,**

*General Manager Boston and Worces-  
ter Street Railway Co., Boston, Mass.*

SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co.,  
Chicago, Ill.*

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND

**JERE C. HUTCHINS**, President Detroit United Railway, Detroit, Mich.

ADDISON B. COLVIN, President Hudson Valley Railway Co., Glens Falls, N. Y.

G. TRACY ROGERS, President Binghamton Railway Co., Binghamton, N. Y.

W. A. SMITH, General Manager Omaha and Council Bluffs Railway Co., Omaha, Neb.

S. L. NELSON, General Manager Wichita Railway and Light Co., Wichita, Kan.

PLACE OF MEETING, ST. LOUIS, MO.

## OFFICERS, 1904-1905

PRESIDENT:

**W. CARYL ELY,**

*President International Railway Co., Buffalo, N. Y.*

FIRST VICE-PRESIDENT:

**ELWIN C. FOSTER,**

*President New Orleans Railways Co.,  
New Orleans, La.*

SECOND VICE-PRESIDENT:

**JOHN I. BEGGS-**

*President Milwaukee Electric Railway and  
Light Co., Milwaukee, Wis.*

THIRD VICE-PRESIDENT:

**RICHARD McCULLOCH,**

*Assistant General Manager United Railways  
Co. of St. Louis, St. Louis, Mo.*

SECRETARY AND TREASURER:

**T. C. PENINGTON,**

*Treasurer Chicago City Railway Co.,  
Chicago, Ill.*

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND

JOHN J. STANLEY, General Manager Cleveland Electric Railway Co., Cleveland, Ohio.

HOWARD F. GRANT, Manager Seattle Electric Co., Seattle, Wash.

CALVIN G. GOODRICH, Vice-President Twin City Rapid Transit Co., Minneapolis, Minn.

FRANK G. JONES, Vice-President Memphis Street Railway Co., Memphis, Tenn.

WALTER E. HARRINGTON, General Superintendent South Jersey Division, Public Ser-  
vice Corporation, Camden, N. J.

PLACE OF MEETING, PHILADELPHIA, PA.



# MINUTES.

PHILADELPHIA MUSEUM,  
PHILADELPHIA, PA.

Wednesday, September 27th, 1905.

*Forenoon Session.*

The President, Hon W. Caryl Ely of Buffalo, called the meeting to order at 11:15 o'clock and said:

*Ladies and Gentlemen:*

By consulting your printed programs you will note that the first order of business is an address of welcome by the Hon. John Weaver, Mayor of Philadelphia. The Mayor became mixed on our various Associations, and came here Monday morning and delivered his address to the Mechanical and Electrical Association. He broke an engagement in Pittsburgh to do so. He is to speak at our annual banquet tomorrow evening, and having made business engagements for this morning, he is unable to be present with us. I told him last evening that I would make his excuses for him, and while I do not remember what I said to him, although my condition was perfectly normal, I may have said to him that so long as he had come here and given the keys of the city to the Mechanical Association, and had nothing left for us but sweet words, we would not miss him as much as if he had the key to bring to us.

In the absence of the Mayor, and considering his words of greeting delivered on Monday morning to apply to us, the next order of business will be the annual address of the President.

President Ely then presented the following address:

## ADDRESS OF THE PRESIDENT.

Gentlemen of the American Street Railway Association:

For the third time the selection of the place of annual meeting has been made by the Executive Committee solely with the desire to locate it at the place deemed by all to be the most desirable from the point of view of the Association as a whole. The merits of Philadelphia as a place of meeting were so conspicuous as to force themselves unaided upon the attention of the Executive Committee. Yet notwithstanding the fact that pursuant to the new method of procedure, the tent of the association has been pitched here purely of our own volition, the courtesies and attentions which have been and are being showered upon us by the President and other officers of the great company which has in its charge the street railway transportation interests of the city, and by the chairman and officers and members of the Manufacturers' and local committees which have assisted in making all the arrangements for the meeting, could not have been exceeded had they been solely responsible for our coming here. The conditions presented here for the holding of such meetings as this are almost ideal. The fine hotel wherein our headquarters are located, together with the other hotel accommodations of the city, are ample and convenient in that regard. These buildings of the Philadelphia Commercial Museums and their accessories are splendidly adapted to the purposes of the exhibits. Philadelphia herself possesses attractions to every patriotic citizen scarcely equaled by any other city. Her early history as the first meeting place of the Continental Congress, the birthplace of the Declaration of Independence, the glorious part played by her and her sons in the War of the Revolution and as a meeting place of the Federal Congress, are enforced upon our attention almost at every turn. She seems to have preserved more of the landmarks of the early days than any sister city. To us in our particular line she appeals not only by reason of her almost

superlative position as a manufacturing city, but also as the place where the immortal Franklin conducted the experiments which perhaps may be characterized as the foundation of electrical science. Manufactures incidental to transportation are here conducted on a large and interesting scale, and the electrical transportation interests of the city are large and intensely interesting. But to crown it all at this particular juncture of the affairs of this Association, when we are about to take steps that will bind us all together in one harmonious set of organizations, working for the common good, together along well-defined and coherent lines, what place could be more fitting for our meeting than the City of Brotherly Love?

In the general field of electric railway work, the events of the past year have been noteworthy. The work of electrification of certain portions of some of the great steam railroads is progressing, and although the projects under way have not yet been completed, nevertheless the continued investigation of the subject has served to make more clearly apparent the relations that ought to obtain between the steam and electric railways of the country, in order that the public, as well as the companies themselves, may realize the greatest benefits from their operation.

Many of the larger steam railroad systems are changing their policy toward the construction of electric railways from one of active and in some cases bitter opposition to either passive acquiescence or quiet assistance. This is an approximation to the conditions that ought to and some day will surely prevail.

The ideal railroad situation, both from the point of view of the companies and the public, would comprise a heavy long-distance railroad doing the freight and through passenger business, aided by a light interurban railway with frequent stations upon which the suburban and interurban passenger business would be transacted, and in connection with these two factors the street railways within and adjacent to the intermediate and

terminal cities would perform the functions of ordinary street railways, as well as those of bringing to and taking from the depots of the first-mentioned systems travelers and their baggage. In this equation we have three factors, each of which supplements the others, and if such a system could be conceived as having been constructed at one and the same time with reference to the relations existing between them we would there have exhibited the ideal transportation system, calculated to serve the convenience and economy of the railroad companies and the public in the very highest degree. Possibly this ideal system may not be hoped for, but a modification of the attitude which has been heretofore exhibited by the managements of nearly all the great steam railroad corporations toward street and interurban railways may do a great deal to procure for all concerned the benefits outlined.

The consolidation of small properties into large and strong organizations continues, and may well be said to be the order of the day. We think it must be conceded that the public and the companies themselves have been benefited in every instance. These larger organizations have the means with which to employ men of greater skill and experience in the mechanical and operating departments; to provide better tracks and equipment and to give better service than would be possible upon small, weak properties.

The standard of transportation employes is continually being raised, and all railway organizations are giving greater attention to the proper instruction of employes, thereby insuring better service and greater safety to the public. The instruction car and other educational apparatus are now becoming regular features of the equipment of many of the large companies, wherein all motormen are required to demonstrate their proficiency in the operation of such equipments before they are given charge of cars. In many cases such instruction is supplemented by schools, where lectures are given on technical and popular subjects by men of prominence.

The conditions attending street and interurban railway employment are continually being improved. The business is becoming established and recognized as one offering solid and substantial rewards to the men who take it up as a profession and life work. Nevertheless, it is a far cry to perfection. Much remains to be done, in the accomplishment of which it is difficult to conceive a more potent instrumentality than this Association when reorganized and readjusted with reference to its affiliated organizations and all others interested in street and interurban railway work.

In the line of technical investigation, the work of the Electric Railway Test Commission at the St. Louis Exposition is of great value. The testing began at St. Louis in the middle of June, 1904, and was continued there until the middle of November, when the corps was then transferred to Anderson, Ind., where the tests continued until the latter part of March, 1905. Immediately upon the completion of the tests the Commission proceeded with the editing of the Report. It was expected that the printed Report would be ready for distribution before this meeting, but by reason of the large amount of work done and the care required in the preparation of the published volume, it will not appear for some little time. It will comprise a bound volume of about 500 pages octavo, and it is believed will be of great value as a contribution of fact concerning some of the things that have been long embraced within the realm of almost pure conjecture. The importance of such investigations, and indeed of all the measures now being taken towards securing the facts concerning everything involved in our business, and making them available for all, instead of locking them up in the breasts of a few, cannot be overestimated.

Notwithstanding the rapid advance in the state of the electric railway art, I think it will be conceded by all that the ratio of advance has not been what it should have been, nor indeed anything like what it would have been if those engaged

in the business had been brought properly in touch with each other through the medium of some recognized authority which was at one and the same time the repository of the experience of all, a common investigator and classifier of facts and experiences, accessible to all for advice and assistance and always ready to furnish desired information. Causes must be revealed before defects can be finally remedied, and the ascertainment of cause depends upon thorough, careful, long continued and scientific investigation.

With the growth of interurban roads, the necessity is becoming more and more apparent of their owning, if not all, at least a greater portion of their own right of way. It is especially important where high speeds are desired, as it is practically impossible to make fast time within the limitations created by vehicular traffic and the location of the ordinary highway. All now agree that wherever practicable private rights of way should be acquired in the first instance of widths ample for the accommodation of double tracks, and in many cases it is considered desirable to grade the right of way and locate the first track and construct the bridges with reference to the future accommodation of a second track. The experience of the steam railroads with double and single-track construction is being repeated by the electric interurban railroads. There is practically no difference between them, except that of motive power. In all other things it would seem that good, common judgment would dictate that we avail ourselves of the long experience of the steam roads. Double tracks are much simpler, easier and safer of operation, and the increased fixed charge occasioned by the double track is, in the judgment of experienced operators, more than compensated for by the saving in dispatchers, signal men and other like employes, and the injuries and damage accounts, to say nothing of the greatly increased carrying capacity.

In the consideration of this branch of the case are involved proper traffic agreements between interurban and city roads,

and the laying of T-rails in cities where practicable to accommodate the deeper flange and broader tread of the wheels of the interurban cars. It is interesting to observe the growing tendency on the part of municipal authorities to recognize the good to be derived from the installation of T-rails in paved city construction. There is also a noticeable recognition of the value of adequate terminal facilities for interurban roads in cities. In some places union depots are being constructed for the handling of passengers, freight and express, and especially is this true in the Middle West.

The convenience of passengers, especially commercial travelers, in the Middle West has brought about the adoption by the Interurban Railway Companies of Central Ohio and Indiana of a coupon book, which is known as the Ohio Interurban Coupon Book, and is recognized upon a number of connecting lines. This is not only proving a convenience to the public, but is having a tendency to regulate fares upon a better basis, which in a number of places have been fixed too low in the beginning, due no doubt to the misconception of the cost of electric railway work which has so generally prevailed in the past. The element of mystery has been pretty well eliminated from the electric railway business, and it will be difficult for anyone to successfully demonstrate the possibility of a lower rate of fare than 5 cents in cities, or from  $1\frac{1}{2}$  cents to 2 cents a mile upon first-class, well-constructed and safely operated interurban railroads.

While speaking of the features of safe operation, it seems proper to mention as a subject worthy of careful consideration the standardization of wheels for interurban practice. In many places steel or steel-tired wheels are being adopted. The best operators agree that they should be productive of good results.

It is pleasing to note that the adoption of safety devices is becoming more general. The first great burden upon the directors, as well as the operating officers of street and interurban railways, is the safety of the passengers entrusted to

their care. The elimination of grade crossings of steam railroads, the installation of block signals and other automatic signals, safety gates, etc., indicate that in electric railway practice, as in steam, the minds of all traffic managers are on the alert to conserve the safety of the traveling public.

Progress is being made in the problems involved in practical operation of single-phase electric railways. While the manufacturers and engineers have been experimenting in these matters for several years, it is only within the present year that railroads have been equipped with this system. The motors and equipment are so designed that the cars may be operated on the standard 500-volt direct-current system in cities, and on 2,200-volt, single-phase, alternating current between cities. The principal advantage gained is that no rotary converters are necessary in sub-stations, stationary transformers being alone necessary, thus decreasing the costs of plant and superintendence. The principal disadvantage which has developed has been the poor acceleration, but this defect is now being remedied. The further progress along this line of development will be watched with great interest, especially when considered in connection with the problems which are attendant upon the electrification of the steam railroads.

It will be remembered that at Detroit three years ago much time was consumed in the consideration of the question of steam turbines, and much doubt was expressed concerning them. The progress in the installation of the steam turbine in railway generating stations affords another notable illustration of the rapid progress in the electric art. The Philadelphia Rapid Transit Company has recently installed turbine units of 6,000 kw capacity each, and the Pennsylvania Railroad electric lines on Long Island are operated by steam-turbine units of 5,500 kw, while the plans of the New York Central Railroad in the neighborhood of New York include 60,000 kw of steam turbine in units of the same size as those of the Philadelphia Rapid Transit Company. The

devotion of so much of the time of the St. Louis, and of this convention to the subject of power is not to be taken as an infringement of the prerogative of the Mechanical and Electrical Association, but it is to be attributed to a desire manifested by the managers to follow up the subject continuously to some definite conclusion.

The matter of fire protection in car houses has received a great deal of attention from street railway companies and insurance companies during the past year. Tests of sprinklers have been conducted at Cleveland, Ohio, and Newark, N. J. The Newark test was attended by Mr. W. Boardman Reed, Engineer of Maintenance of Way and Buildings, New York City Railway Company; Mr. Albert H. Stanley, Gen'l Superintendent, Public Service Corporation of New Jersey, and Mr. H. S. Wilgus, Engineer of Way and Structures, Brooklyn Heights Railroad Company, representing this Association. The question of insurance of street railway properties is closely linked with the important question of fire protection. For several years attempts have been made to establish a system of insurance that would comprise exclusively street and electric railway risks. It is a subject of the greatest importance, and the belief is becoming general that a great saving can be effected in this item of general expense. In connection with the reorganization of this Association there will undoubtedly be established an Insurance Committee, which in connection with the Accountants' Association, will thoroughly investigate this matter, and undoubtedly make a report that will be of great value to all concerned.

With this brief general resume of the progress of electric railway work during the past year, I will leave the subject and come to those that in their nature are fundamental; those that affect the every-day life of the corporations, and in their last analysis practically determine their rights to exist and to hold and manage their property and enjoy the legitimate profits thereof. At this juncture it may be interesting to note the

magnitude of the interests involved in street, interurban and elevated roads at present included in the electric railway industry. In the United States in the year 1904 there were operated 993 roads, having a total of 30,187 miles of track, operating 75,904 cars and representing a total capitalization of about three and one-quarter billions of dollars, while in Canada there were 42 roads with a total of 900 miles of track, and 2,639 cars and a total capitalization of sixty-nine and one-half millions of dollars. In addition to these figures, there are to be considered the roads in Mexico and certain of the colonies of the United States. When considered in connection with billions of invested capital, the questions alluded to above become of all-absorbing interest and importance to this Association. For many years past there has been evidenced in this and similar organizations a disinclination to discuss such questions, or even investigate them to any great extent. Within the past two years, however, there has appeared a growing desire in this Association for the investigation of such questions, and the collection of accurate data and information concerning them. With a view of ascertaining the subjects uppermost in the minds of the men engaged in the practical consideration of the problems today surrounding electric railways, I have within the past few months addressed inquiries, both oral and written, to many thoughtful and able men, and am now able to state that from nearly every one has come a response pointing out the necessity for information and the facts. It may be of interest to you if I quote from one of the letters written by an officer of this Association, one who is the active manager of an important property, and by reason of business association intimately acquainted with the operation of a number of other railway properties. My correspondent writes as follows:

I hope and believe that the Association will be reorganized at the coming meeting along the lines which have been suggested and which have recommended themselves to the Executive Committee, and the Bureau or Department of Statistics and Information, which I have considered would be of the greatest benefit

to member companies, will be promptly organized and work begun, so that the information obtained by it would soon be available for use.

In the Middle West and on the Pacific Coast public opinion is being rapidly crystallized by individuals presuming to represent public interest, to the end that municipal control and ownership of public utilities may soon become an issue in municipal and State politics.

A great mass of erroneous information is being recorded and published, which is tending to influence the public mind, and which, if not refuted in some manner by a recognized association or authority by the publication of correct and verified information, will tend to seriously affect the invested interests in these utilities. It seems to me that it is within the reasonable scope of our Association to cause to be circulated and widely published statements of facts that will controvert statements made by these self-constituted censors of the public good.

Others of wide experience, several of whom are perhaps in closer touch with public sentiment and what is going on in the world along these lines than any other individual members of this Association, have said to me in substance: "The question is up; it will not down at our bidding; one side of the case only is being presented and argued, and the arguments in favor of the proposition are largely based upon alleged propositions of fact that are either erroneous, or concerning which a gross misconception prevails." Our side of the case has never been presented, nor indeed has any publication of the facts as we know them ever been made to the public. The forum resounds with the cries of agitators and demagogues, aided by many honest but misguided or misinformed men, while among the representatives of the vast interests which are thus injuriously threatened, silence prevails. Some have indeed taken the position that a wave of sentiment is sweeping over the land that is founded upon error and will dissipate itself. That it is founded upon error we all believe, but at present the indications are that there is pretty nearly an unanimous sentiment in favor of taking means to assist in correcting the misunderstanding which seems to prevail.

At the meeting of the New York State Street Railway Association, held at Lake George last June, the feeling was pretty nearly unanimous that the subject should be taken up and thoroughly investigated, and that Association determined to actively assist this Association in its investigation in any way in which it might be called upon. A most interesting paper was there read by Mr. Henry W. Blake, editor of the *Street Railway Journal*. In that paper, Mr. Blake says:

It is now apparent that a serious wave of agitation in favor of municipal ownership, so-called, is sweeping over the country; that the principal is un-American and contrary to our theories of government which have so far proved so successful. \* \* \* What has been or can be accomplished in this direction under autocratic, bureaucratic or socialistic governments is not the question in America unless we adopt one or the other of these forms of government. The question is, Can or cannot municipal ownership and management be more successful under our present forms of State and municipal government than the system which has operated so successfully in this country? So far, the education of the American people upon the subject of municipal ownership has principally been academic, theoretical, haphazard and unbusinesslike, generally conducted by those who have no practical familiarity with the subject.

I must content myself with this brief quotation from Mr. Blake's admirable and very exhaustive paper, and commend the same to each and every one of you.

At the twenty-eighth convention of the National Electric Light Association, at Denver and Colorado Springs last June, an exhaustive report upon the subject of municipal ownership was read by Mr. Arthur Williams, of the New York Edison Company. The report is confined to the question as affecting electric lighting properties, but its bearing upon railway interests is clearly evident, and the pamphlet of nearly 200 pages abounds in statements of fact that if given thorough and wide publicity, would undoubtedly do much to change the feeling in the mind of the ordinary property-owning citizen and voter in our great municipalities. Mr. Williams, among other things,

refers to the statement which has been given general circulation, that electric lighting in Chicago costs something less than \$60 annually per arc lamp, and then shows from an exhaustive presentation of the figures and facts involved in that case that many important items of cost are deliberately omitted in the Chicago lighting accounts, notwithstanding that the omissions, as he states, have been frequently been brought to the attention of the municipal authorities. Some of the items are the rental value of the offices occupied by the lighting department; services rendered by other departments of the city government, including the legal department, and that through which the supplies are purchased; the paving of the streets for original subway work, as well as for repairs which is done by and charged to the street department; water, taxes, insurance, interest and depreciation.

Mr. Williams further calls attention in his valuable report to the consular reports upon municipal ownership, issued by the Department of Commerce and Labor of the United States Government during the month of May. He says that they seem to have been referred to by the press as favorable to municipal undertakings, but that he has been able to find little, if anything, in them which justifies this view. That making no allowance for the omissions usually found in municipal bookkeeping, with very few exceptions they appear rather to support the opponents of municipal ownership and operation.

Since reading Mr. Williams' report I have read the consular reports referred to, which comprise the reports of United States consular officers upon the subject of municipal ownership from 1897 to 1905. Even the brief examination which in the time allotted to me I have been able to give these reports, convinces me of the correctness of Mr. Williams' conclusions, and I commend the pamphlet, No. 2,256 of the Daily Consular Reports, to the careful attention of those present.

Within the past year the Mayor of a great Middle Western city has called to his aid the manager of the street railways in

the city of Glasgow, who has made an investigation and report. While the contents of the report have not been made public, it is my understanding, and that of others who have conversed with the expert, that his opinion is not favorable to municipal ownership of street railways in the cities of this country under existing municipal conditions.

Let us pause for a moment and reflect upon the fact that in the neighboring city of New York, according to statements in the Metropolitan press, one of the great political parties is contemplating prosecuting the coming municipal campaign upon the principle of municipal ownership of street railways and other so-called public utilities. From figures obtained from the presidents of the different railroads in the city of New York, it appears that there are approximately 34,000 men employed in street railway work in that city. This number of men constitutes nearly 6 percent. of the total vote cast in the last Mayoralty election in Greater New York, and more than 50 percent. of the plurality received by the successful candidate. If an average wage of \$60 a month is assumed, these men are paid and receive more than \$24,000,000 per annum. These figures are the more remarkable when it is considered that all, or nearly all, of these 34,000 men have fathers, brothers and others eligible to vote who are more or less dependent upon them.

I think there could be little doubt concerning the probable tenor of a report from Mr. Dalrymple upon the desirability or non-desirability of this proposition in Greater New York.

However, it is not my purpose to now enter upon a discussion of the doctrines involved in the question of municipal socialism. The foregoing are intended as mere allusions, made in order to attract your attention to the importance and desirability of investigation along certain lines intimately affecting the interests which you represent, and brings me to the question of the reorganization and reformation of this Association and those associated with it. I take it that it will not be neces-

sary for me to make any extended statement at this time concerning this matter. The proposed new Constitution and By-Laws have been sent, together with a letter from your President, carefully explaining their purpose and all that has been done in relation thereto, to all members of this Association, and also, accompanied by a communication from the Membership Committee, to all non-member electric railway companies, throughout the countries which are within the jurisdiction of the Association. This proposed form of Constitution and By-Laws will now be brought before you for final action. They embody the result of two years' careful and thoughtful work, and it is believed by your Executive Committee and a large number of others who are prominent in the Association, that they are well adapted to bring about an organization which will be of great value. There are many questions of detail that will remain to be settled after their adoption, and I desire to say now, once for all, that there is not in the mind of any of those who are responsible for the proposed changes a thought in derogation of the autonomy or dignity of any of the affiliated associations. It is intended that in a well-defined and intelligent way the work of all the associations shall be carefully laid out in advance, so that by harmonious and correlative work the greatest advantage may be secured from the united efforts of all. In determining the work to be done the various committees will be consulted, so that the final program will represent and constitute the common judgment of representatives duly accredited from each of the organizations. In behalf of the parent organization, any intention to weaken or unnecessarily interfere with any of the affiliated organizations is expressly disclaimed.

It seems proper to say that it is intended that there shall be a well-equipped general Secretary's Office, where will be properly collected and cared for information concerning electric railway properties and questions which may hereafter seem of such importance to the Association as to require investigation.

The accumulation of such data will be systematized, and the members of the Association will from time to time by announcements and notices be made conversant with the resources of the Secretary's Office, and in every way encouraged to call upon the Secretary for information.

It is also intended that a great deal of work shall be done by small, compact working committees, whose records shall be kept on file in the office of the General Secretary, and that he shall be secretary ex-officio of all said committees. However, I find myself in danger of going too much into detail, and I will conclude my reference to this subject by saying to you that I heartily believe that the adoption of the new forms of organization and their careful working out will result in unqualified benefit to all.

The first product of the reorganization has been the Manufacturers' Association. It has succeeded almost beyond the most sanguine expectations of its promoters, and the exhibit which has been assembled here affords the very best justification of the change that has been made. Splendid as this exhibit is, it has been assembled here without any expenditure of time or money on the part of any of the officers of this Association. The Manufacturers' Association not only pays its way, but it has provided this hall, which is our meeting place, and in other ways is contributing to the comfort and convenience of the members of our different associations. I did not feel that I could close these remarks without referring to the gentlemen who, by unremitting efforts, have assembled here this really beautiful and complete exposition of articles used in electric railway work, and provided so generously for our entertainment and pleasure. I feel, however, that I ought to warn you not to devote too much time to the examination of these exhibits, lest you be caught in the predicament of the friend of Mr. Dooley, who, to use that gentleman's language, "Wint to th' Cintinyal in Philydephy an' los' th' use iv his legs thrav-elin' fr'm th' display iv mohair shawls to th' mannyfacthry iv open-face watches."

In concluding, I wish to return my sincere thanks to all the members of the Executive Committee, and many others, both in and outside of this organization, but interested in its work, for the invariable courtesy and patience with which they have met many trying situations that have arisen during the past year, and with which they have always met my requests for assistance. I trust that when you leave this place it will be with a feeling that this, the twenty-fourth annual meeting of this Association, has been its greatest achievement. I thank you again for the invariable forbearance which has been shown to me as your presiding officer, and bespeaking a further continuation of the same, I await the pleasure of the Convention. (Applause.)

President Ely—The next order of business is the calling of the roll. If there is no objection, the registration at the door will take the place of the roll call and that will be passed. Not hearing any objection, it is so ordered.

#### DELEGATES OF MEMBERS.

(Arranged Alphabetically According to Companies.)

The following named gentlemen were in attendance at the meeting, representing companies that are members of the Association:

Alton, Granite and St. Louis Traction Co.

    George D. Rosenthal, Electrical Engineer.

Altoona & Logan Valley Elec. Ry. Co.

    S. S. Crane, General Manager.

    W. W. Perkins, Assistant Treasurer.

    W. R. Power, Electrician.

Atlantic Coast Electric R. R. Co.

    G. B. Cade, Auditor.

    S. F. Hazelrigg, General Manager.

    J. E. Phillips, Chief Clerk.

Atlantic Shore Line Railway Co.

    F. S. Donnell, Vice-President.

Augusta Railway & Electric Co.

R. E. Hunt, General Manager.

John Blair McAfee, President.

Austin Electric Railway Co.

F. H. Watriss, Vice-President.

W. H. Young, President.

Bangor Railway and Electric Co.

John R. Graham, President.

Benton Harbor & St. Joseph Elec. Ry. & Lt. Co.

W. Worth Bean, President.

Birmingham Ry., Lt. & Pwr. Co.

C. M. Cory, Treasurer.

Charles A. Doerr, Purchasing Agent.

Boston Elevated Ry. Co.

J. T. Hughes, Attorney.

C. E. Learned, Chief Inspector.

Edward Mahler, Purchasing Agent.

R. A. Sears, General Attorney.

Charles S. Sergeant, Vice-President.

Henry L. Wilson, Auditor.

Boston & Northern St. Ry. Co.

David Curtin, Roadmaster.

Erwin F. Files, Superintendent.

H. E. Farrington, Superintendent Car Repairs.

Boston & Worcester St. Ry. Co.

Milan V. Ayres, Electrical Engineer.

E. P. Shaw, Jr., General Superintendent.

James F. Shaw, President.

W. H. Wadsworth, Master Mechanic.

Bridgeton & Millville Trac. Co.

W. H. Myers, Electrician.

W. J. Mulholland, Purchasing Agent.

A. M. Sharp, Electrician and Master Mechanic.

Brockton & Plymouth St. Ry. Co.

Albah H. Warren, Manager.

Brooklyn Rapid Transit Co.

W. B. Graham, Superintendent Surface Lines.

O. H. Page, Assistant to Engineer of Equipment.

W. J. Sherwood, Chief Clerk, Operating Department.

Edward Taylor, Engineer of Equipment.

R. C. Taylor, Mechanical Engineer.

Calumet Elec. St. Ry. Co.

H. M. Sloan, Manager.

Camden Interstate Ry. Co.

James Fagan, Electrical and Chief Engineer.

Hon. John Graham, President.

H. P. Wellman, Superintendent Motive Power.

Capital Traction Co.

G. T. Dunlop, President.

John H. Hanna, Electrician.

J. W. Harper, Master Mechanic.

F. Morrill, Roadmaster.

Central Penn. Traction Co.

J. S. Boas, Chief Clerk.

F. M. Davis, Superintendent of Transportation.

J. W. Early, Auditor.

P. F. Gehrhart, Electrical Engineer.

Blaine Marsh, Electrician.

Frank B. Musser, President.

J. O'Connell, Purchasing Agent.

Mason D. Pratt, Engineer.

A. F. Rexroth, Master Mechanic.

Charleston Cons. Ry., Gas & Elec. Co.

P. J. Balaguer, Secretary.

T. W. Passailaigue, Superintendent Railway Division.

L. Y. Dawson, Engineer Railway.

Chester Traction Co.

John Buggy, Electrical Engineer.

Arthur G. Jack, Superintendent.

C. V. Mills, Superintendent.

Chicago City Ry. Co.

W. R. Crawford, Car Inspector.

John Farrow, Car Inspector.

William Farrow, Car Inspector.

Clarence R. Manzer, Assistant to Secretary.

T. C. Penington, Treasurer.

Chicago & Joliet Elec. Ry. Co.

John R. Blackhall, General Manager.

A. S. Kibbe, Chief Engineer.

G. S. Patterson, Electrician and Master Mechanic.

Chicago Union Tr. Co.

C. A. Caul, General Roadmaster.

N. M. Thorrsen, Purchasing Agent.

## Cincinnati Traction Co.

Thomas Elliott, Chief Engineer.

## Cleveland Elec. Ry. Co.

Charles H. Clark, Engineer Maintenance of Way.

E. J. Cook, Chief Engineer.

H. J. Davies, Secretary.

A. E. Duty, Superintendent.

A. C. Kennedy, Assistant Purchasing Agent.

W. G. McDole, Auditor.

G. L. Radcliffe, Superintendent.

M. Rohrheimer, Manager Advertising Department.

H. N. Staats, Insurance Department.

## Cleveland &amp; So. Western Tr. Co.

E. P. Roberts, Engineer.

## Colorado Springs &amp; Interurban Ry. Co.

B. M. Lathrop, Superintendent.

## Columbus Ry. &amp; Lt. Co.

M. S. Hopkins, General Superintendent.

A. H. S. Cantlin, Engineer.

## Columbus R. R. Co.

F. E. Reidhead, Manager.

## Concord, Maynard &amp; Hudson St. Ry. Co.

H. V. Hammond, Track Foreman.

Charles A. Kabley, Director.

John W. Ogden, Purchasing Agent.

## Conestoga Traction Co.

Samuel Charles, Superintendent Transportation.

F. D. Connely, Master Mechanic.

H. W. Crawford, Engineer Maintenance of Way.

Jefferson F. Kershner, Consulting Engineer.

C. Edgar Titzel, General Superintendent.

## Connecticut Ry. &amp; Ltg. Co.

Charles F. Bryant, Auditor.

R. C. Crane, Engineer.

William Darb  , General Superintendent.

Uriah Foss, Master Mechanic.

W. H. Kershaw, Assistant Engineer.

L. S. Risley, Superintendent.

M. E. Stark, Superintendent of Track.

Paul Spencer, Inspector Electric Plants.

H. L. Wales, Superintendent Track.

A. V. Wainwright, Superintendent.

Connecticut Ry. & Ltg. Co.  
William Wyllner, Engineer.

Consolidated Rys. Lt. & Pwr. Co.  
A. B. Skelding, Manager.

Consolidated Ry. Co. (New Haven, Ct.)  
J. K. Punderford, General Manager.  
E. M. T. Ryder, Engineer.  
Calvert Townley, First Vice-President.

Dayton, Springfield & Urbana Elec. Ry. Co.  
Theodore Stebbins, General Manager.

Dayton & Western Traction Co.  
George W. Botham, General Superintendent.

Denver City Tramway Co.  
S. W. Cantrel, General Manager.

Des Moines City Railway Co.  
G. B. Hippee, General Manager.

Detroit United Railway.  
Paul Dohrman, General Superintendent.  
H. B. Flowers, Assistant Division Superintendent.  
Irwin Fullerton, Auditor.  
Thomas P. Lynch, Record Clerk.  
S. Walter Mower, Division Superintendent.

Elgin, Aurora & Southern Tr. Co.  
Edwin C. Faber, Vice-President.  
J. T. Huntington, General Manager.

Elmira Water, Lt. & R. R. Co.  
H. M. Beardsley, Secretary and Treasurer.  
J. T. J. Chapman, Chief of Armature Winders.  
J. Creighton, Master Mechanic.  
Francis G. Maloney, Superintendent.  
C. L. Post, Purchasing Agent.

El Paso Elec. Ry. Co.  
H. T. Edgar Vice-President.

Exeter, Hampton & Amesbury St. Ry. Co.  
Franklin Woodman, General Manager.

Fairmount & Clarksburg Tr. Co.  
Ernest Hutton, Division Superintendent.

Fishkill Electric Ry. Co.  
J. T. Smith, President.

Fitchburg & Leominster St. Ry. Co.  
G. L. Enfors, Superintendent Motive Power.  
W. W. Sargent, Superintendent.  
H. A. Willis, President.

Fort Wayne & Wabash Valley Tr. Co.

    Fred C. Rapp, Master Mechanic.

    H. S. Vordemark, Auditor.

Gardiner, Westminster & Fitchburg Ry. Co.

    Walter R. Dame, Assistant Treasurer.

Georgia Railway & Elec. Co.

    A. Balsley, Electrical Engineer.

    S. T. Glenn, Inspector.

    T. K. Glenn, Vice-President.

    W. H. Glenn, Superintendent Roadway.

    G. B. Graves, Purchasing Agent.

    S. E. Simmons, Superintendent Transportation.

Grand Rapids, Grand Haven & Muskegon Ry. Co.

    W. K. Morley, Vice-President.

Grand Rapids Ry. Co.

    W. W. S. Butler, General Superintendent.

Hartford & Springfield St. Ry. Co.

    H. S. Newton, General Superintendent.

Hartford St. Ry. Co.

    E. S. Goodrich, Director.

Haverhill & Amesbury St. Ry. Co.

    W. L. Adams, Director.

    L. E. Lynde, Superintendent.

    E. P. Shaw, President.

Holmesburg, Tacony & Frankford Elec. Ry. Co.

    Frederick M. Glazier, Chief Engineer.

    Henry Glazier, Superintendent.

Hoosac Valley St. Ry. Co.

    W. T. Nary, Superintendent.

Houston Elec. Ry. Co.

    R. E. Hamilton, Purchasing Agent.

    C. D. Wyman, General Manager.

Hudson Valley Ry. Co.

    J. G. Phillips, Purchasing Agent.

Indiana Railway Co.

    Arthur Kennedy, President.

Indianapolis Tr. & Term. Co.

    John J. Mahoney, Superintendent.

Indiana Union Tr. Co.

    Chas. A. Baldwin, Superintendent Transportation.

    Worth A. Baldwin, Assistant Superintendent Transportation.

    H. A. Nicholl, General Manager.

Interborough Rapid Transit Co.

Frank Hedley, General Manager.

International Railway Co.

Charles A. Coons, Superintendent Transportation.

H. F. Fitts, Secretary to General Manager.

Richard T. Garwood, Superintendent Buildings.

George C. Graham, Superintendent Motive Power.

F. D. Jackson, Superintendent Transportation.

Morris D. Lloyd, Purchasing Agent.

H. L. Mack, Superintendent Line Construction.

J. E. Stevenson, General Passenger Agent.

Jackson Elec. Ry., Lt. & Power Co.

Barron G. Collier.

John Lorenz, General Manager.

Jacksonville Electric Co.

William H. Tucker, Manager.

Kenosha Elec. Ry. Co.

Bion J. Arnold, President.

W. L. Arnold, Vice-President.

R. G. Arnold, Secretary and Treasurer.

Knoxville Traction Co.

H. T. Bunn, Treasurer.

T. C. Kelly, Superintendent.

P. E. Mitchell, General Superintendent.

Lake Shore Elec. Ry. Co.

F. W. Coen, Secretary.

B. Mahler, Director.

Lansing & Suburban Tr. Co.

James R. Elliott, General Manager.

J. J. Martindale, Assistant Engineer.

Lebanon Valley St. Ry. Co.

Simon P. Light, Solicitor.

William R. McIlvain, Director.

Charles H. Smith, Superintendent.

Lehigh Traction Co.

Andrew F. Harger, Superintendent Transportation.

C. B. Houck, General Superintendent.

A. Markle, President.

Lehigh Valley Tr. Co.

H. C. Barrow, Superintendent.

Edward Burke, Superintendent Track.

R. C. Denblaser, Superintendent Lines.

Lehigh Valley Tr. Co.  
    C. B. Easty, Master Mechanic.  
    W. H. Hall, Chief Engineer.  
    W. S. Hall, General Manager.  
    C. M. Walter Treasurer.

Little Rock Railway & Elec. Co.  
    J. A. Trawick, General Manager.

Louisville & Eastern R. R. Co.  
    H. C. Marsh, Purchasing Agent.  
    Percival Moore, Vice-President.

Louisville Railway Co.  
    S. G. Boyle, Secretary and Treasurer.  
    T. H. Minary, Assistant General Manager.  
    T. J. Minary, President.

Lynchburg Tr. & Lt. Co.  
    R. D. Apperson, President.  
    D. C. Frost, Superintendent.

Madison Traction Co.  
    Geo. H. Shaw, Superintendent.

Manila Elec. R. R. & Ltg. Co.  
    Frederick H. Reed, Secretary and Treasurer.  
    C. A. Slyvester, Assistant Engineer.

Memphis Street Railway Co.  
    S. H. Dailey, General Purchasing Agent.  
    A. D. McWhorter, Master Mechanic.  
    E. E. Vreeland Assistant to President.

Menominée and Marinette Lt. & Tr. Co.  
    Edward Daniell, Secretary and Manager.

Metropolitan St. Ry. Co. of Kansas City, Mo.  
    Charles N. Black, General Manager.

Michigan Traction Co.  
    D. A. Hegarty, General Superintendent.  
    Gerald Holsman, Vice-President.  
    L. H. Mountney, Superintendent.

Milwaukee Elec. Ry. & Lt. Co.  
    M. M. Austin, Superintendent Transportation.  
    John I. Beggs, President.  
    H. C. Mackay, Auditor.

Mobile Lt. & R. R. Co.  
    J. H. Wilson, President.

Montreal St. Ry. Co.  
    T. W. Casey, Purchasing Agent.

## Montreal St. Ry. Co.

Nelson Graburn, Master Mechanic.  
R. M. Hannaford, Chief Engineer.  
Duncan McDonald, Manager.  
W. G. Ross, Managing Director.  
Ludger Trudeau, General Superintendent.

## New Jersey &amp; H. R. Ry. &amp; Ferry Co.

F. W. Bacon, General Manager.

## New Orleans Rys. Co.

H. J. Dressell, Superintendent.  
H. A. Ferrandou, Treasurer.

## Newport News &amp; Old Pt. Ry. &amp; Elec. Co.

E. L. Holtzclaw, Electrician.

## New York City Ry. Co.

R. E. Benning, Electrical Engineer.  
Jos. F. Daly, Attorney.  
T. A. Delaney, Superintendent Transportation.  
W. T. Dougan, Trackmaster.  
J. F. Kane, Chief Inspector.  
Richard W. Meade, Director.  
Thomas W. Millen, General Master Mechanic.  
H. A. Newell, District Superintendent.  
F. G. Robinson, Assistant General Master Mechanic.  
Henry A. Robinson, General Solicitor.  
J. J. Shea, Superintendent Western District.  
A. C. Tully, Purchasing Agent.  
H. H. Vreeland, President.

## New York &amp; Port Chester Ry. Co.

C. O. Mailloux, Electrical Engineer.

## New York &amp; Queens County Ry. Co.

F. L. Fuller, Vice-President and General Manager.

## Norfolk, Portsmouth &amp; Newport News Co.

R. T. Chiles, Superintendent Portsmouth Division.  
H. Root Palmer, General Superintendent.

## Northampton St. Ry. Co.

Edwin C. Clark, Superintendent.

## Northern Ohio Tr. &amp; Lt. Co.

Chas. Curry, Vice-President and General Manager.  
O. A. Lyon, Superintendent.

## Northwestern Elevated R. R. Co.

H. M. Brinkerhoff, Superintendent.  
F. J. Guernsey, Superintendent Loop Division.

Northwestern Elevated R. R. Co.

R. B. Stearns, Superintendent.

Oakland Tr. Consolidated.

J. Q. Brown, General Manager.

Ohio River Elec. Ry. & Pwr. Co.

I. L. Oppenheimer, Superintendent.

Old Colony St. Ry. Co.

G. F. Seibel, General Superintendent.

Omaha & Council Bluffs St. Ry. Co.

W. A. Smith, General Manager.

Ottawa Elec. Ry. Co.

James D. Fraser, Secretary and Treasurer.

J. E. Hutcheson, Superintendent.

W. W. Wylie, Master Mechanic.

Pennsylvania & Mahoning Valley Ry. Co.

W. T. Burns, Assistant Treasurer and Auditor.

F. C. McGonigle, Purchasing Agent.

C. A. Severance, Master Mechanic.

People's Railway Co.

R. W. Crook, General Manager.

Philadelphia Rapid Transit Co.

Thomas Allen, Assistant to Chief Surveyor.

H. P. Amet, Assistant to Surveyors.

Harry Bacon, Engineer.

James Bricker, Superintendent Transportation.

O. H. Burns, Dispatcher.

John Doughty, Division Foreman.

James Duffy, Division Foreman.

Charles B. Ebert, Mechanical Engineer.

Frank B. Ellis, Chief Clerk Lines and Cables.

Walter Ellis, General Superintendent.

Wm. B. Gardner.

C. W. Harvey, Lines and Cables.

E. D. Hibbs, Division Foreman.

J. D. Hiestand, Comptroller.

T. J. Janvier, Engineer.

H. C. Kaefflinger, Civil Engineer.

Wm. J. Kelly, Auditor.

Wm. C. Kerr, Assistant Engineer.

Paul R. Kline, Inspector of Material.

Harry Kressman, Clerk to Electrical Engineer.

Chas. O. Kruger, Second Vice-President and Gen. Mgr.

## Philadelphia Rapid Transit Co.

Chas. N. Leathern, Jr., Architectural Engineer.  
F. H. Lincoln, Assistant General Manager.  
W. L. Maize, Purchasing Agent.  
J. L. Markel, Electrical Engineer.  
J. C. Marshall, Engineer.  
Chas. M. Mills, Prin. Assistant Engineer, Subway & Elev. Ry.  
J. Newlin, Inspector.  
H. B. Nichols, Engineer of Way.  
R. G. Oliver, Master Mechanic.  
D. Roby Payne, Civil Engineer and Mechanical Engineer.  
J. G. Reid, Chief of Surveys.  
Alex. Renwick, Third Vice-President.  
W. A. Robinson, Engineer.  
S. M. Rose, Paymaster.  
R. B. Selfridge, Secretary and Treasurer.  
Arthur O. Stanis, Roadway Engineer.  
C. W. Stewart, Road Engineer.  
J. S. Skinner, Manager Printing Department.  
James J. Springer, Special Agent.  
W. E. Trout, Roadway Engineer.  
Herbert N. Twells, Assistant Engineer.  
W. S. Twining, Chief Engineer.  
A. F. Walls, Division Engineer.  
John J. Walls, Inspector.  
F. Wampler, Master Mechanic.  
George C. Wynkoop, Jr., Assistant Superintendent.

## Philadelphia &amp; West Chester Tr. Co.

H. Hayes Aikens, Secretary.  
Thomas Conway, Agent.  
Charles B. Fulton, Assist. Superintendent and Ch. Engineer.  
C. L. Rihl, Treasurer.  
A. Merritt Taylor, President.  
William S. Taylor, Vice-President.  
W. G. Woolfolk, Superintendent.

## Pittsburg Railways Co.

John Murphy, General Superintendent.

## Pittsburg, McKeesport &amp; Greensburg Ry. Co.

W. D. Chapman, General Manager.

M. A. Coffey, Superintendent.

Richard Reamer, Master Mechanic.

Portland Consolidated Ry. Co.

F. S. Drake, Superintendent.

Portland Railroad Co.

Charles F. Libby, President.

E. A. Newman, General Manager.

William A. Wheeler, Director.

Providence & Danielson Ry. Co.

Julius Christensen, Director.

N. G. Hollister, Director.

D. F. Sherman, Vice-President.

J. E. Thielsen, Superintendent.

Public Service Corp. of N. J.

J. N. Ackerman, Traffic Manager.

E. A. Armstrong, Counsel and Director.

George Barker, Real Estate Agent.

W. W. Bolen, District Superintendent.

M. R. Boylan, District Superintendent.

J. J. Burleigh, Vice-President.

F. H. Brown, District Superintendent.

P. A. Clerkin, Chief Draughtsman Maintenance of Way.

S. T. Corliss, Railway Auditor.

A. E. Dickson, Chief Clerk Railway Department.

A. Eastman, Superintendent Employes.

Dudley Ferrand, General Manager Electrical Department.

J. R. Gilkyson, General Agent.

J. J. Given, Statistician.

George H. Hastings, Inspector.

F. A. Hewett, Superintendent South Jersey Division.

W. G. Hoag, Assistant Engineer Ry. Department.

H. A. Johnson, Chief Engineer.

Paul Lupke, Electrical Engineer.

Wilbur J. McAllister, Paymaster.

Thomas W. McAndrews, District Superintendent.

C. B. McComb, Statistician.

John McFeeley, Assistant Engineer.

J. A. Piersen, Purchasing Agent.

J. R. Shurtz, Auditor.

Charles C. Smith, Assistant to General Agent.

A. H. Stanley, Superintendent Transportation.

Charles A. Sterling, Vice-President.

H. C. Stevenson, Secretary to Vice-President.

J. B. Whitehead, Assistant Purchasing Agent.

Public Service Corp. of N. J.

J. R. Wilson, General Storekeeper.

P. N. Wilson, Supervisor.

Quincy Horse Ry. & Carrying Co.

H. E. Chubbuck, General Manager.

Rhode Island Co., The.

H. V. Brown, Claim Agent.

H. F. Purrington, Superintendent Tracks and Roadway.

H. F. Purvington, Jr., Track Foreman.

George J. Roberts, Consulting Engineer.

R. I. Todd, General Manager.

Rochester Railway Co.

H. M. Butler, Purchasing Agent.

W. C. Callaghan, Division Superintendent.

D. F. Carver, General Superintendent.

J. Clarence Collins, Secretary and Assistant Treasurer.

R. E. Danforth, General Manager.

G. L. Estabrook, Treasurer.

W. R. W. Griffin, Assistant Superintendent.

J. W. Hicks, Superintendent Transportation.

F. P. Maize, Chief Electrician & Master Mechanic

Rockford & Interurban Ry. Co.

F. M. Baylies, Superintendent.

F. A. Poor, Consulting Engineer.

Rockland, Thomaston & Camden St. Ry. Co.

Thomas Hawkins, General Manager.

Valentine Chisholm, Superintendent.

Geo. E. Macomber, President.

Saginaw Valley Tr. Co.

J. C. Young, General Superintendent.

San Diego Elec. Ry. Co.

Charles McLagan, Superintendent Engineer.

San Juan Light & Transit Co.

W. E. Goldsborough, Electrical Engineer.

W. E. Harrington, Operating Manager.

William Pestell, Chief Engineer.

Savannah Electric Co.

L. R. Nash, Manager.

Schenectady Ry. Co.

Frank A. Brown, Claim Agent.

E. F. Peck, General Manager.

## Schuylkill Valley Tr. Co.

Robert N. Carson, Director.  
George Hoeger, General Manager.  
Frank Lugar.  
George Magill  
L. Rowan, Receiver.

## Scranton Ry. Co.

C. A. Pearson, Jr., Auditor.  
P. T. Reilly, Superintendent Transportation.  
Frank Silleman, Jr., General Manager.  
C. Ford Stevens, Secretary and Treasurer.  
E. A. Wildt, Superintendent Power Equipment.

## Seattle Electric Co.

F. Dabney, Assistant Treasurer.  
Mark Lowd, Chief Engineer.

## Shamokin &amp; Mt. Carmel Elec. Ry. Co.

George M. Smith, President and General Manager

## Sioux City Tr. Co.

R. E. Belknap, Chief Engineer.  
E. L. Kirk, General Manager.

## South Chicago City Ry. Co.

William Walmsley, Superintendent.

## Southwest Missouri Elec. Ry. Co.

A. G. Knisely, Secretary.  
E. J. Pratt, Superintendent.

## Spartenburgh Ry., Gas &amp; Lt. Co.

F. D. McEwen, Vice-President and Treasurer.

## Spokane Traction Co.

H. B. Ferris, Treasurer.  
Clyde M. Graves, Assistant General Manager.  
J. P. Graves, President.  
J. B. Ingersoll, Civil Engineer.  
A. L. White, Vice-President.

## Springfield Consol Ry. Co. (Ill.)

Emil G. Schmidt, General Manager.

## Springfield Railway Co., The.

Henry J. Crowley, Vice-President.  
Frank J. Pryor, Jr., Auditor.

## Springfield Street Ry. Co.

H. C. Page, General Manager.  
G. N. Pellissier, Roadmaster.  
George Webb, Electrical Engineer.

Steubenville Tr. & Lt. Co.

S. P. Curtis, Vice-President.

J. C. Ross, General Manager.

Morris W. Stroud, President.

St. Joseph Ry. L., H. & Pwr. Co.

C. T. Hewitt, General Superintendent.

St. Louis & Suburban Ry. Co.

J. S. Walsh, Jr., Vice-President and General Manager.

Syracuse Rapid Tr. Co.

E. G. Connette, Vice-President and General Manager.

J. E. Duffy, Superintendent.

Philip T. Honald, Purchasing Agent.

J. M. Joel, Auditor.

Tacoma Railway & Pwr. Co.

J. S. Simpson, Assistant Treasurer.

Terre Haute Tr. & Lt. Co.

G. F. Wells, Manager.

Topeka Railway Co.

L. E. Myers Vice-President.

A. M. Patton, General Superintendent.

Toronto Railway Co.

W. H. Moore, Assistant to President.

Trenton St. Railway Co.

Peter Hurley, General Manager.

George E. MacPherson, Solicitor.

Edward A. Murray, Director.

Tri-City Railway Co.

J. G. Huntoon, General Superintendent.

James F. Lardner, General Manager.

Twin City Rapid Tr. Co.

Calvin G. Goodrich, Vice-President.

Union Electric Co.

L. D. Mathes, General Manager.

United Railways Co., St. Louis, Mo.

James Adkins, Treasurer.

F. L. Betts, Superintendent Time Tables.

Richard McCulloch, Assistant General Manager.

United Railways & Elec. Co.

Gen. J. M. Hood, President.

W. H. Staub, Purchasing Agent.

United Railroads of San Francisco.

Thomas Finigan, Assistant Purchasing Agent.

Union St. Ry. Co., (New Bedford, Mass.)

Joseph Moore, Chief Engineer.

E. E. Potter, General Superintendent.

Elton S. Wilde, Treasurer.

United Traction Co. of Albany, N. Y.

H. A. Benedict, Chief Engineer.

United Traction Co., Reading, Pa.

Alvin Dunlap, Superintendent.

T. W. Grookett, Jr., Secretary and Treasurer.

Frederick Haas, General Storekeeper.

William Hoyer.

C. C. Long, Electrical Engineer.

Howard Rhoda, Superintendent Coil Room.

John A. Rigg, President.

Walter A. Rigg, General Manager.

F. A. Tyson, Mechanical Engineer.

Utah Lt. & Ry. Co.

W. P. Read, Superintendent Railway Service.

Utica & Mohawk Valley Ry. Co.

C. Loomis Allen, General Manager.

Washington Ry. & Elec. Co.

Gordon Campbell, Purchasing Agent.

H. W. Fuller, General Manager.

W. F. Ham, Comptroller.

Washington Water Power Co., The.

D. L. Huntington, General Manager.

West Pennsylvania Rys. Co.

J. W. Brown, Superintendent Transportation.

Lucien Hill, Assistant to President.

W. E. Moore, General Superintendent.

Wheeling Traction Co.

G. O. Nagle, General Manager.

Wichita R. R. & Lt. Co.

S. L. Nelson, Vice-President.

Wilkes-Barre & Wyoming Valley Tr. Co.

William S. Bell, Comptroller.

Col. William J. Harvey, Director.

Robert Koehler, Master Mechanic.

Remi Remont, Vice-President.

W. A. Rosen, Assistant Auditor.

Thomas A. Wright, General Superintendent.

Williamsport Pass. Ry. Co.

E. H. Davis, General Manager.

Wilmington & Chester Traction Co.

William Geiger, Superintendent.

S. S. Hoff, General Manager.

Worcester Consolidated St. Ry. Co.

J. W. Lester, Treasurer.

J. F. McCabe, Purchasing Agent.

York Street Ry. Co.

A. H. Hayward, General Manager.

#### REPRESENTATIVES OF NON-MEMBERS.

(Arranged Alphabetically According to Companies.)

Companies not members of the Association were represented as follows:

Atlantic City & Suburban Tr. Co.

E. L. Folsom, General Superintendent.

Berkeley Street Railway Co.

J. B. N. Cordoza, Superintendent.

Cincinnati Northern Tr. Co.

C. E. Palmer, Superintendent.

Easton Transit Co.

Harrison R. Fehr, President.

Green Bay Traction Co.

George W. Knox, Vice-President.

Illinois Traction Co. System.

L. E. Fischer, General Manager.

Jersey Shore & Antes Fort R. R. Co.

Robert McCullough, President.

Nahant & Lynn St. Ry. Co.

J. E. Dozier, General Manager.

Norfolk Railway & Light Co.

W. J. Kehl, Secretary and Treasurer.

Rochester & Eastern Rapid Ry. Co.

J. H. Pardee, General Manager.

Westchester Traction Co.

T. R. Crumley, Assistant to Engineer.

Wilmington City Ry. Co.

William Geiger, Superintendent.

Samuel S. Hoff, General Manager.

## TRADE PAPERS.

The following named representatives of the technical press were in attendance at the meeting:

## ENGINEERING NEWS

F. E. Schmitt

## ELECTRICAL REVIEW

Ainslie A. Gray

## ELECTRICAL WORLD AND ENGINEER

A. S. McAllister      T. C. Martin      J. M. Wakeman

## KENFIELD PUBLISHING COMPANY

F. S. Kenfield      H. J. Kenfield      William Padget

## McGRAW PUBLISHING COMPANY

H. B. Abbott    C. A. Baptiste    H. W. Blake    H. S. Buttenheim  
E. V. Clark    J. S. Cravath    C. B. Fairchild, Jr.

## RAILWAY AGE

M. V. Dee      M. H. Miner

## STREET RAILWAY BULLETIN

John J. Lane

## STREET RAILWAY JOURNAL

Henry W. Blake      W. K. Beard      J. R. Cravath  
C. B. Fairchild, Jr.      James H. McGraw

## STREET RAILWAY REVIEW

L. E. Gould      Daniel Royce      R. M. Standish      J. B. Wenger

## WESTERN ELECTRICIAN

M. L. Godkin

## OFFICIAL STENOGRAFHER

T. E. Crossman.

## OTHER ATTENDANTS.

The following named gentlemen were also present:

J. H. Belser, Jr., Secretary to the President.  
W. M. Bisel, Representative A. B. Herrick.  
H. L. Champion.  
T. R. Connette.  
E. G. Daniels.  
W. E. Danner.  
Henry L. Doherty.  
W. F. Dorsey.  
W. C. L. Eglin.  
Hon. W. Caryl Ely, President of the Association.  
Thomas Farmer.  
William J. Fiss, O. C., P. R. C. Co.  
C. Fliegehut, Division Superintendent Ridge Avenue Depot.  
John H. Fry.  
Arthur E. Garwood.  
William D. Gherky, formerly Assistant Superintendent Lines  
and Cables, Philadelphia Rapid Transit Company.  
E. J. Hall, Architect for F. W. Darlington.  
Leigh W. Harrington.  
W. H. Johnson.  
N. C. Keernan, City Passenger Agent Wabash Ry., Chicago.  
J. H. Lucas.  
J. B. McCall, President Assn. Edison Illuminating Companies.  
F. Marchant.  
H. C. Moore, formerly Vice-President of the Association,  
and ex-President Trenton (N. J.) Street Railway Company.  
N. Mutter.  
L. D. Pelleissier.  
A. W. Pratt.  
Edmund N. Pryor.  
Leslie McQuilken.  
W. L. Rathman, University of Pennsylvania.  
D. Carl Reichard.  
Ernest N. Ross, Stenographer.  
H. V. Schreiber.  
Bernard V. Swenson, University of Wisconsin.

## MINUTES OF THE LAST MEETING.

President Ely: Gentlemen, the next order of business is the approval of the minutes of the last meeting. If there is no objection, they will stand approved as heretofore printed without being read. There being no objections, they are approved.

If there are any persons present who are representatives of companies not members of the Association, and they desire that their companies shall become members of this Association, we will be glad if they will make known their wish to the Secretary at the close of this session.

## NEW MEMBERS.

(Arranged Alphabetically According to Companies.)

The following companies acquired membership during the meeting:

Bangor & Northern R. R. Co., Bangor, Me.  
Consolidated Railways Light & Power Co., Wilmington, N. C.  
Fries Mfg. & Power Co., Winston-Salem, N. C.  
Gardner, Westminster & Fitchburg St. Ry. Co., Gardiner, Mass.  
Hartford & Springfield St. Ry. Co., Hartford, Conn.  
Kingston Consolidated R. R. Co., Kingston, N. Y.  
Kokomo, Marion & Western Trac. Co., Kokomo, Ind.  
Laredo Electric & Ry. Co., Laredo, Texas.  
Parkersburg, Marietta & Interurban Ry. Co., Parkersburg, W. Va.  
Peoples Railway Co., Wilmington, Del.  
Portsmouth, Dover & York St. Ry. Co., Portsmouth, N. H.  
Richmond Light & R. R. Co., New Brighton, N. Y.  
Rutland St. Ry. Co., Rutland, Vt.  
Shamokin & Mt. Carmel Elec. Ry. Co., Shamokin, Pa.  
Spartanburg Ry., Gas & Light Co., Spartanburg, S. C.  
Syracuse, Lake Shore & Northern R. R. Co., Syracuse, N. Y.  
Syracuse Northern Traction Co., Syracuse, N. Y.  
West Chester St. Ry. Co., West Chester, Pa.  
Winnebago Traction Co., Oshkosh, Wis.

President Ely: I wish to say at this time that several letters of regret have been received from different persons who are unable to be present at this meeting, which will be laid before you. The Secretary has also received invitations from several organizations which will be laid before the convention. There are also delegates from other organizations that have been officially appointed by the different State Street Railway organizations and Railway Clubs, whose names will be laid before you.

## LETTERS OF REGRET.

The Secretary then read the following letters:

New Orleans, La., Sept. 7th, '05.

Mr. T. C. Penington, Secretary American Street Railway Association, 2020 State Street, Chicago, Ill.

Dear Mr. Penington: Your favor of the 5th inst. duly received. I note the request of the President that all members of the Executive Committee meet in Philadelphia on Tuesday, September 26th at 10 a. m., but regret exceedingly that it will be impossible for me to attend the meeting, as we have many matters here of importance which require my attention, and also have a condition prevailing here which makes it uncomfortable traveling just at present, which condition I am happy to say is improving.

Regretting that I cannot be present, and with kindest regards, I am,

Yours very truly,  
E. C. FOSTER.

Seattle, Washington, Sept. 12, 1905.

T. C. Penington, Esq., Secretary American Street Ry. Assn., Chicago, Ill.

Dear Sir: As it will be impossible for me to attend the Convention in Philadelphia, I have concluded to write you concerning a few matters which may be considered of interest to the Executive Committee and the Association at that meeting.

I wrote President Ely on the 2nd inst. somewhat as follows: "I hope and believe that the Association will be reorganized at

the coming meeting along the lines which have been suggested and recommend themselves to the Executive Committee and that the Bureau or Department of Statistics and Information, which I have considered will be of the greatest benefit to member companies, will be promptly organized and work begun, so that the information obtained by it will be soon available for use."

"In the Middle West and on the Pacific Coast, public opinion is being rapidly crystalized by individuals assuming to represent public interest to the end that municipal control and ownership of public utilities may soon become an issue in municipal and state politics. A great mass of erroneous information is being recorded and published, which is tending to influence the public mind, and which if not refuted in some manner by a recognized association or authority by the publication of correct and verified information, will tend to seriously affect invested interests in these utilities. It seems to me that it is within the reasonable scope of our Association to cause to be circulated and widely published, statements of facts that will controvert statements made by these self constituted censors of the public good."

Another matter: I am in favor of an amendment to the proposed Constitution and By-Laws admitting to membership such firms as the Tucker, Anthony & Co., E. W. Clark & Co., J. G. White & Co., Westinghouse, Church, Kerr & Co., Stone & Webster, McGraw Publishing Co., Street Railway Review Publishing Co., etc., etc., as I think this would be a very wise and advantageous move, and if it is ever to be done it would seem best to do it now. The experience of these firms is very broad and their observation very wide, and must certainly far exceed in these regards any solitary isolated member company. The data and statistics which firms of this class have gathered in connection with their construction and operation of propositions, through experienced men trained in the art, should be, if available to the Association and its Statistical Bureau, of great benefit to all the members.

There are, of course, many questions which will be of interest for consideration, but as the time is short and the program of the meeting practically already made, I do not think at this time of any more important matters than those hastily noted above.

Regretting my inability to attend the Convention, and with the wish that it may be the most successful yet held, I am,

Yours very truly,

H. F. GRANT.

President Ely: The Secretary has further announcements to make.

COURTESIES EXTENDED BY THE ENGINEERS' CLUB.

American Street Railway Association,  
Philadelphia Museum,  
Philadelphia, Pa.

Gentlemen: The Engineers' Club of Philadelphia tenders to the Officers and Members of your Association, the privileges of the Club House for the week ending September 30th, 1905.

Yours v'r'y truly,  
JOHN F. LOOMIS.,  
Chr. House Committee.

COURTESIES EXTENDED BY THE INTERNATIONAL  
SPRINKLER CO.

To the American Street Railway Association.

Gentlemen: As the subject of Fire Protection is of vital interest to the members of the American Street Railway Association, we have the pleasure of extending to you an invitation to visit our plant, located at 2019-25 Washington Av., Philadelphia, and witness the manufacture and test of a most complete line of Automatic Fire Extinguishing devices.

To reach our plant, take the South Street car going east and transfer to the Tasker Street car on 22nd street going south, getting off at 21st Street and Washington Avenue.

Our experts will be at the factory from 8 a. m. until 5 p. m., and we trust to have the pleasure of seeing you.

Yours very truly,  
A. M. LEWIS,  
Secretary.

COURTESIES EXTENDED BY THE MANUFACTURERS CLUB.

Mr. T. C. Penington, Secretary American Street Railway Association, Bellevue-Stratford, Philadelphia, Pa.

Dear Sir: It gives me great pleasure to inform you that at the request of Mr. Wm. H. Hulings, Jr., of the J. G. Brill Car Works, the Board of Directors of the Manufacturers' Club cordially extended the privileges of the Club House to your Association during your stay in the city.

Sincerely trusting you will avail yourselves of this privilege,  
I am,

Yours very truly,  
J. D. C. HENDERSON,  
Secretary.

P. S. The doormen have been instructed to recognize your badge as a token of membership.

President Ely: The next business will be the Report of the Executive Committee, which will be read by the Secretary.

#### REPORT OF THE EXECUTIVE COMMITTEE.

The Secretary read the report as follows:

To the American Street Railway Association.

Gentlemen: The report of your Executive Committee will consist, as in past years, of the minutes of the several meetings held during the year, which will show what has been done by your Committee.

MINUTES OF MEETING OF THE EXECUTIVE COMMITTEE  
OF THE AMERICAN STREET RAILWAY ASSOCIATION,  
HELD AT THE HOLLAND HOUSE, NEW YORK  
CITY, FRIDAY AND SATURDAY, FEB-  
RUARY 3 AND 4, 1905.

Friday Afternoon's Session.

President Ely called the meeting to order at 2 o'clock. (This meeting of the Executive Committee was called in conjunction with the meeting of a joint committee embracing representatives from the American Street Railway Association, the Street Railway Accountants' Association, the Railway Mechanical and Electrical Association, the Street Railway Claim Agents' Association and the Street Railway Manufacturers' Association, to consider ways and means for the reorganization of the American Street Railway Association and its allied organizations.)

Present: W. Caryl Ely, President; Richard McCulloch, Third Vice-President; Howard F. Grant, Calvin G. Goodrich, Walter E. Harrington and T. C. Penington, Secretary and Treasurer.

The Secretary read letters from Messrs. Elwin C. Foster, First Vice-President; John I. Beggs, Second Vice-President, and

John J. Stanley, members of the committee, stating they regretted they would not be able to attend the meeting of the committee.

The Secretary also read a telegram from Mr. Frank G. Jones, member of the Committee, saying that he was delayed at Cincinnati by a railroad accident, but would arrive at 3 o'clock.

The President stated that only routine business would be transacted at this meeting of the committee; that the selection of papers for the forthcoming convention, and other business, would be taken up at a subsequent meeting of the committee.

The Treasurer presented a report of the financial condition of the association, showing a balance on hand, February 1st, of \$9,035.

On motion the report was ordered filed.

The Treasurer reported the following companies as delinquent in the payment of dues for two years:

Atlantic Shore Line Railway Company, Kennebunkport, Me.  
Ithaca Street Railway Company, Ithaca, N. Y.

Interurban Railway & Terminal Company, Cincinnati, O.

Mr. Goodrich moved that the three delinquent members be notified by the Secretary that unless their dues are paid by July 1, 1905, they will be dropped from membership.

Motion carried.

The renewal of the Treasurer's bond, issued by the American Surety Company of New York, in the amount of \$10,000, renewed to February 1, 1906, was presented to the committee by the Treasurer, and placed in the possession of the President.

Mr. Goodrich moved that the salary of the Secretary-Treasurer be continued at Fifteen Hundred Dollars (\$1,500) per annum, as in past years.

Motion carried.

The President presented the following communication:

February 3d, 1905.

To the Executive Committee of the American Street Railway Association,

Gentlemen: I beg to announce that in compliance with the authority conferred upon me by the last convention I have appointed the following named gentlemen members of a special committee to be known as the "Membership Committee" of the American Street Railway Association:

H. H. Vreeland, President New York City Railway Company,  
New York.

C. S. Sergeant, Vice-President Boston Elevated Railway Company, Boston.

James F. Shaw, President Boston & Worcester Electric Companies, Boston.

William A. House, General Manager United Railways & Electric Company, Baltimore.

H. J. McGowan, President Indianapolis Traction & Terminal Company, Indianapolis, Ind.

W. Caryl Ely, President International Railway Company, Buffalo.

Daniel Royse, Street Railway Review, Chicago.

James H. McGraw, Street Railway Journal, New York.

John J. Lane, Street Railway Bulletin, Boston.

Respectfully,

W. Caryl Ely.

On motion adjourned until Saturday morning.

#### Saturday Morning's Session.

The committee reconvened at 10:15 o'clock.

Present: W. Caryl Ely, President; Richard McCulloch, Third Vice-President; Howard F. Grant, Calvin G. Goodrich, Frank G. Jones, Walter E. Harrington and T. C. Penington, Secretary and Treasurer.

Mr. H. H. Vreeland was also present at the session of the committee.

An invitation from Mr. Frank Hedley, manager of the Interborough Rapid Transit Company, to the members of the committee to take a ride on his special car in the New York subway, was read and accepted with thanks.

The Secretary stated that an invitation to hold the next convention of the association at West Baden, Ind., had been received.

The President stated that it had become the policy of the association to select its place of meeting, independently of invitations from local companies, and that the next meeting of the association would be held in any city which the committee might select, except in such cases where it might be, for local reasons, undesirable to the street railway companies in the city.

Mr. Goodrich moved that the place for the 1905 meeting of the association be Philadelphia, Pa.

Motion carried.

Mr. McCulloch moved that the fourth week in September, 1905, be selected as the time for the next meeting of the association.

Motion carried.

Mr. Goodrich moved that the President appoint a committee to look after the preliminary arrangements for the holding of the meeting in Philadelphia.

Motion carried.

The President appointed Mr. W. E. Harrington, representing the Executive Committee, and Mr. W. H. Heulings, representing the Manufacturers' Association, to act with the President and Secretary of the American Street Railway Association in selecting a hotel for headquarters, in providing meeting rooms and in making all other necessary arrangements.

Professor W. E. Goldsborough, of Purdue University, appeared before the committee and outlined the experimental work, in determining wind resistance to electric cars, which had been carried on at St. Louis during the World's Fair. The work had been conducted under the auspices of the Electric Railway Test Commission, consisting of Mr. Vreeland, Mr. White, Mr. McGraw, Mr. McCulloch and Mr. Wilgus, appointed by President Francis of the Louisiana Purchase Exposition. He stated that in the construction of the special car which was used in the tests the Indiana Union Traction Company contributed much in the way of material and time of its shop force; the J. G. Brill Company supplied the car body, the Baldwin Locomotive Works the trucks, the Fairbanks Morse Company the scales, and so on with the rest of the equipment; that he understood the manufacturers who supplied the parts of the car would be willing that the car should remain in its present state and not be dismantled, and that it would be agreeable to them to have the car turned over to the custody of the American Street Railway Association, so that it could be available for tests on the roads of the members of the association.

Prof. Goldsborough stated that Purdue University would house the car; that it had tracks running into the campus of the University and that the car would be available for use by the members of the association at any time; and further, that there would be no expense incident to the holding of the car.

Prof. Goldsborough further stated that the Commission would be pleased to place in the custody of the American Street Railway Association the data sheets showing the results of the tests which had been made on the car.

Mr. Harrington moved that the matter be referred to a committee with power to take such action as necessary between the present time and the next meeting of the Executive Committee; it being understood that the association is not prepared to go to any expense in the matter.

Motion carried.

(The Committee was not appointed.)

On motion of Mr. Grant the following was adopted: That a vote of thanks be extended to Prof. Goldsborough, and through him to Purdue University, for the proposition made to this association regarding the test car and to the Test Commission for their interest and favor in the matter.

Adjourned.

T. C. PENINGTON, Secretary.

MINUTES OF MEETING OF THE EXECUTIVE COMMITTEE  
OF THE AMERICAN STREET RAILWAY ASSOCIA-  
TION, HELD AT THE BELLEVUE-STRATFORD  
HOTEL, PHILADELPHIA, MONDAY AND  
TUESDAY, JUNE 12 AND 13, 1905.

Monday's Session.

President Ely called the meeting to order at 10:10 a. m.

Present: W. Caryl Ely, President; John I. Beggs, Second Vice-President; John J. Stanley, Calvin G. Goodrich, W. E. Harrington and T. C. Penington, Secretary and Treasurer.

The Secretary announced that Mr. Frank G. Jones had been delayed in reaching the meeting.

The minutes of the meeting of the Executive Committee, held February 3 and 4, were, on motion of Mr. Stanley, approved as printed.

President Ely announced that since the last meeting of the Executive Committee he had severed his connection with the International Railway Company in an official capacity, and suggested that a provision be made in the by-laws of the Association that in case any duly elected officer of the Association should, during his term of office, cease to be actively identified with the street railway business, that such withdrawal from street railway business shall not affect the relations of said officer to the Association during the time for which he was elected.

The Treasurer presented a report to June 1, 1905.

On motion of Mr. Goodrich the interim report of the Treasurer was accepted and placed on file.

## Tuesday's Session.

President Ely called the meeting to order at 9:15 a. m.

Present: W. Caryl Ely, President; John J. Stanley, Calvin G. Goodrich, Frank G. Jones, W. E. Harrington and T. C. Pennington, Secretary and Treasurer.

Mr. Goodrich moved that the annual convention be held during the week of September 25, at the Philadelphia Museum, and that the days of the week be assigned to the affiliated organizations as follows:

Mechanical Department, Sept. 25 and 26.

Claim Agents Department, Sept. 25 and 26. .

American Street Railway Association, Sept. 27 and 28.

Accountants Department, Sept. 28, 29 and 30.

Each department to meet at 10 o'clock on each day of its session and hold a continuous session.

On motion the Bellevue-Stratford was selected as the headquarters of the Association, the annual banquet to be held on the evening of Thursday, September 28, and tickets to the banquet to be sold at cost.

Mr. Harrington moved that all papers to be presented at the meeting be sent to the Secretary not later than August 15 and that copies of the papers be mailed to the members before the date of the meeting. (Carried.)

Mr. Jones moved that the following named gentlemen be appointed to suggest topics for papers for the 1906 convention:

For the American Street Railway Association, Messrs. Beggs, Goodrich and Jones; for the Accountants' Association, Mr. John R. Henry; for the Mechanical Association, Mr. J. S. Doyle; for the Claim Agents' Association, Mr. B. B. Davis.

On motion, it was decided that arrangements be made for a luncheon to be served at the Convention Hall each day, at moderate cost, so that all members may remain in attendance upon the sessions of the Convention until the same are ended.

Mr. John B. Parsons was appointed chairman of the local committee, Messrs. Rawle and Martin to serve on the committee with Mr. Parsons.

It was decided that the papers to be presented at the meeting of the American Street Railway Association in 1905 should relate to Gas Engines, the Diesel Engine, and Organizations; the President being authorized to secure writers to prepare such papers. On motion, adjourned.

T. C. PENINGTON, Secretary.

MINUTES OF THE MEETING OF THE EXECUTIVE COMMITTEE OF THE AMERICAN STREET RAILWAY ASSOCIATION, HELD AT THE BELLEVUE-STRATFORD HOTEL, PHILADELPHIA, TUESDAY, SEPTEMBER 26, 1905.

President Ely called the meeting to order at 10 o'clock a. m. There were present W. Caryl Ely, President; John I. Beggs, Second Vice-President; Richard McCulloch, Third Vice-President; John J. Stanley, Calvin G. Goodrich, Frank G. Jones, W. E. Harrington and T. C. Penington, Secretary and Treasurer, representing the American Street Railway Association; W. G. Ross, Elmer M. White and C. L. S. Tingley, representing the Accountants' Association; H. H. Adams, representing the Mechanical Association; and James R. Pratt, representing the Claim Agents' Association.

The Secretary read letters of regret from Elwin C. Foster and Howard F. Grant at their inability to be in attendance at the meeting.

The Secretary read the Minutes of the Executive Committee-meetings held Feb. 3 and 4, 1905, and June 12 and 13, 1905; also the minutes of the joint conference held on the same days.

The minutes were amended to show the appointment of Mr. Goodrich and Mr. Harrington as the Committee to arrange for the care of the test car "Louisiana" at Purdue University.

Secretary Penington presented the annual report of the Secretary and Treasurer, which was on motion received and placed on file.

On motion of Mr. Beggs, the President was authorized to appoint a committee to prepare suitable resolutions to go upon the minutes of the Executive Committee and the Association, and to be properly engrossed and transmitted to Secretary Penington, expressing the appreciation of the Executive Committee and the Association of his valuable services during the ten years that he had held the office of Secretary and Treasurer of the Association. The President appointed as such committee Mr. Beggs, Mr. Goodrich and Mr. Harrington.

The President appointed as a committee to examine the accounts and vouchers of the Treasurer, Messrs. Jones and Stanley.

The Secretary announced that invitations had been received from Atlantic City, West Baden, Niagara Falls and Put-in-Bay.

to hold the meeting of the Association at one of those points next year. The invitations were referred to the incoming Executive Committee.

The Secretary stated that he had received several applications for membership accompanied by checks for \$10 each, the proposed admission fee under the new Constitution and By-Laws, and on motion the matter was laid over until the adoption of the new Constitution and By-Laws.

The President appointed as a committee on memorials of deceased members Messrs. Goodrich, Beggs and Jones.

Mr. Harrington presented the following resolution on behalf of the committee in charge of the Test Car "Louisiana":

**RESOLVED**, That the President be, and he hereby is, authorized and empowered to accept, in the name of the Association, the test car "Louisiana" from the Electric Railway Test Commission, and be it further

**RESOLVED**, That the President be, and he hereby is, authorized and empowered to accept the proposition of the President of Purdue University, whereby the University agrees to properly house and care for the test car without expense to the American Street Railway Association.

W. E. HARRINGTON,  
C. G. GOODRICH,  
Committee.

On motion, the resolution was adopted.

The President stated that the committee on car wiring which did some important work a year ago, had been continued, and recently there was received another communication from the Underwriters' Association asking for a conference concerning certain proposed amendments to the rules which were adopted a year ago. There had been a vacancy in the committee occasioned by Mr. Ballard, of Boston, retiring from the railway business, and he had appointed in his place Mr. John Lindall, of Boston.

Mr. Beggs drew attention to the necessity for the appointment of a committee to take in charge the question of compensation for carrying mails for the U. S. Government and suggested that the committee should be composed of three or five representative street railway presidents or managers.

The President requested Mr. Beggs to prepare a recommendation to that effect, to be presented to the convention.

Mr. H. J. Davies and Mr. Henry N. Staats addressed the meeting on the subject of a mutual protective fire insurance company

among the street railway companies and on the subject of better protection to the property of railway companies against fire.

On motion the following resolution was adopted:

Resolved, that the Executive Committee recommend to the Association that there shall be a regular Standing Committee of the Association to be known as the Committee on Insurance and Fire Protection to be composed of five members to be appointed by the President.

President Ely: Gentlemen, you have heard the report of the Executive Committee. What action will you take on it?

Mr. W. P. Read, Salt Lake City: I move that the report be accepted and ordered printed in the minutes. (Motion seconded and carried.)

President Ely: The next business will be the Report of the Secretary and Treasurer.

#### REPORT OF THE SECRETARY AND TREASURER.

Secretary Penington presented the following report:  
To the American Street Railway Association—

Gentlemen:—Your Secretary and Treasurer respectfully submits the following report:

#### NEW MEMBERS.

The following companies acquired membership at and since the last meeting:

Chattanooga, Tenn.—Rapid Transit Company.

Cleveland, Ohio—Cleveland & Southwestern Traction Company.

Columbus, Ohio—Dayton, Springfield & Urbana Electric Railway Company.

Dubuque, Iowa—Union Electric Company.

Fairmont, W. Va.—Fairmont & Clarksburg Traction Company.

Fitchburg, Mass.—Fitchburg & Leominster Street Railway Company.

Hampton, Va.—Newport News & Old Point Railway & Electric Company.

Lansing, Mich.—Lansing & Suburban Traction Company.

Macon, Ga.—Macon Railway & Light Company.

Madison, Wis.—Madison Traction Company.

Manila, P. I.—Manila Electric Railroad & Light Company.

New Haven, Conn.—Consolidated Railway Company of New Haven.

Philadelphia, Pa.—Philadelphia & West Chester Traction Company.

Richmond, Ind.—Richmond Street & Interurban Railway Company.

Sheboygan, Wis.—Sheboygan Light, Power & Railway Company.

Spokane, Wash.—Spokane Traction Company.

Tacoma, Wash.—Tacoma Railway & Power Company.

Wellston, Mo.—St. Louis, St. Charles & Western Railroad Company.

#### MEMBERS WITHDRAWN.

Galesburg, Ill.—Galesburg Electric Motor & Power Company.

Hamilton, Ont.—Hamilton Cataract Power & Traction Company.

Meridan, Conn.—Meridan Electric Railroad Company.

New Haven, Conn.—Fairhaven & Westville Railroad Company.

Norwich, Conn.—Norwich Street Railway Company.

Venice, Ill.—Granite City & St. Louis Railway Company.

#### MEMBERS SUSPENDED FOR NON-PAYMENT OF DUES.

Cincinnati, Ohio—Interurban Railway & Terminal Company.

Ithaca, N. Y.—Ithaca Street Railway Company.

#### MEMBERSHIP ACCORDING TO STATES.

Delaware .....	1	Kansas .....	4
Louisiana .....	1	West Virginia .....	4
Maryland .....	1	Washington .....	4
Nebraska .....	1	Wisconsin .....	5
South Carolina .....	1	Georgia .....	5
Utah .....	1	Iowa .....	5
Mississippi .....	1	New Jersey .....	5
Oregon .....	2	Missouri .....	5
Arkansas .....	2	Texas .....	8
Alabama .....	2	Indiana .....	9
District of Columbia .....	2	Michigan .....	13
Florida .....	2	Massachusetts .....	13
Minnesota .....	2	Illinois .....	16
Montana .....	2	Ohio .....	17
Rhode Island .....	2	New York .....	18
Colorado .....	2	Pennsylvania .....	23
Maine .....	3	Canada .....	5
Virginia .....	3	Mexico .....	1
Kentucky .....	3	Porto Rico .....	1
California .....	3	Philippine Islands .....	1
Connecticut .....	3		—
Tennessee .....	4	Total .....	206

## RECAPITULATION.

## MEMBERSHIP.

September 20, 1904 . . . . .	196
New members since last report . . . . .	18
<hr/>	
Withdrawn . . . . .	214
Suspended for non-payment of dues . . . . .	8
<hr/>	
Membership September 15, 1905 . . . . .	206

## DUES UNPAID, 1905.

Atchison, Kan., Atchison Railway, Light & Power Company	\$25.00
Levis, Quebec, Levis County Railway Company . . . . .	25.00
Leavenworth, Kas., Kansas City-Leavenworth Railway Company . . . . .	25.00
New York, N. Y., New York & Port Chester Railroad Company . . . . .	25.00

## CASH.

Cash in Bank September 20, 1904 . . . . .	\$ 7,646.56
Receipts to September 15, 1905:	
Annual dues . . . . .	\$ 4,712.50
Admission fees . . . . .	425.00
Interest on deposits . . . . .	140.79
	<hr/>
	\$ 12,924.85

## Expenses to September 15, 1905:

Printing and stationery . . . . .	\$ 2,066.05
Postage . . . . .	198.74
Salaries . . . . .	1,500.00
Annual Convention, 1904 . . . . .	493.52
Annual Convention, 1905 . . . . .	20.00
Executive Committee . . . . .	1,582.40
Committee on Rules . . . . .	31.12
Committee on Mails . . . . .	88.00
Re-organization Committee . . . . .	212.82
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Cash in Bank September 15, 1905 . . . . .	6,732.20
	\$ 12,924.85

## CERTIFICATE OF BALANCE.

The Continental National Bank of Chicago.

Chicago, September 15, 1905.

I hereby certify that the balance due the American Street Railway Association on the books of the Continental National Bank, of Chicago, at the close of business on the Fifteenth day of September, 1905, was Six Thousand Seven Hundred Thirty-two 20-100 Dollars.

(Signed) THE CONTINENTAL NATIONAL BANK OF CHICAGO.

By IRA P. BOWEN,  
Assistant Cashier.

## REPORT OF AUDITING COMMITTEE.

Philadelphia, Pa., September 26, 1905.

To the Executive Committee of the American Street Railway Association—

Gentlemen: We have examined the report of the Treasurer, T. C. Penington, for the past year, and find the same correct as appears by proper vouchers accompanying the same.

(Signed) F. G. JONES,  
(Signed) JOHN J. STANLEY,  
Auditing Committee.

Gentlemen: The Executive Committee of this Association desiring a technical man to act in the capacity of Secretary, also a man who can devote his entire time to the work of such office, this is, in all probability, the last year I shall serve the Association as Secretary.

In looking back over the past ten years I can truthfully say that I have filled the office of Secretary to the best of my ability. Of course, there have been errors made, but "to err is human" as everyone knows.

I wish to take this opportunity of thanking the many friends, old and new, whom I have made during the years of my work for their kindness and assistance; and, in case I have been unfortunate enough to have gained the ill will of any, I sincerely trust the same has not been lasting.

Hoping you will call upon me at any time in case I can render any assistance, I beg to remain,

Very respectfully,  
T. C. PENINGTON,

President Ely: In asking you what your pleasure will be concerning the report of the Secretary and Treasurer, it appears only fitting to say that so far as his association with the work of these kindred organizations has gone, and the fidelity with which Mr. Penington has performed his duties, that sometimes brought him into conflict with the wishes of some that could not be affirmatively met and served, it has seemed to me always, that the last and final result has been of acknowledgement on the part of all of his sincerity in the discharge of his duty; and so far as feelings of ill will are concerned, I fancy that none who have come into contact with him in all the ten years of his work, cherish anything toward him other than a feeling of respect and esteem and warm friendship. Fitting resolutions will be reported to the Association by a committee appointed for that purpose, which will be engrossed and presented to Mr. Penington, with the hope that when he looks at these resolutions, he will know that they emanated from the hearts of his friends.

If there is no objection, the report of the Secretary and Treasurer will be received and filed. There being no objection, it was so ordered.

I wish to announce at this time that there are several delegates from other organizations that have been officially appointed by the different State Street Railway organizations and railway clubs, whose names will also be laid before you. I wish to say, also at this moment, that I owe many thanks to the members of the Executive Committee of the Association, and other gentlemen, who have offered kind and valuable suggestions made to me upon request, concerning the subject of my remarks this morning. I offer grateful acknowledgements.

President Ely: The next order of business is the Report of the Committee on Reorganization.

Let me say that this is a very important matter that the Secretary will read, and it has seemed to us that it should

be presented in its entirety, so that all may understand thoroughly the great amount of work and thoughtful investigations that have been devoted to the question of reorganization, that you may know that no one is following out any fad or anything of that kind, but that which will be laid before you and which will be brought up for discussion is the result of the work of many men, and the expenditure of much time,—good men and good time, which has been devoted to the affairs of the Association, without any reward, or any hope of reward, and the prospect, probably, of getting into a lot of trouble.

The Secretary then read the minutes of the various joint conferences between the representatives of the parent association and the allied organizations, as follows:

#### REPORT OF THE REORGANIZATION COMMITTEE.

JOINT MEETING OF THE EXECUTIVE COMMITTEE OF THE AMERICAN STREET RAILWAY ASSOCIATION AND REPRESENTATIVES OF THE STREET RAILWAY ACCOUNTANTS' ASSOCIATION OF AMERICA, REPRESENTATIVES OF THE AMERICAN RAILWAY MECHANICAL AND ELECTRICAL ASSOCIATION, REPRESENTATIVES OF THE CLAIM AGENTS' ASSOCIATION, AND REPRESENTATIVES OF THE AMERICAN STREET RAILWAY MANUFACTURERS' ASSOCIATION, HELD AT THE HOLLAND HOUSE, NEW YORK CITY, FEBRUARY 3 AND 4, 1905.

The following named gentlemen were present:

Representing the American Street Railway Association: Messrs. W. Caryl Ely, Richard McCulloch, Howard F. Grant, Calvin G. Goodrich, Frank G. Jones, Walter E. Harrington and T. C. Penington.

Representing the Street Railway Accountants' Association: Messrs. W. G. Ross, F. R. Henry, P. S. Young, J. W. Lester, Isaac McQuilkin and E. M. White.

Representing the American Railway Mechanical and Electrical Association: Messrs. C. F. Baker, H. H. Adams, John Millar, S. W. Mower, J. S. Doyle and D. F. Carver.

Representing the Claim Agents' Association: Mr. W. A. Dibbs.

Representing the American Street Railway Manufacturers' Association: Messrs. D. M. Brady, W. H. Heulings, Jr., F. C. Randall, William Wharton, jr., J. H. McGraw and Newcomb Carleton.

There were also present: Messrs. Walton H. Holmes, James F. Shaw, H. W. Blake, C. B. Fairchild, jr., F. S. Kenfield, H. F. Kenfield, Prof. W. E. Goldsborough, H. H. Vreeland, C. C. Peirce, E. H. Baker, George Keegan and B. M. Barr.

Mr. W. Caryl Ely, President of the American Street Railway Association, called the meeting to order on Friday at 12 o'clock sharp, and said:

I will just say a word or two, if you please. We have thought it best to assemble in a sort of general meeting to have some discussion concerning the matters which interest us at this time, before taking these matters up in our respective committees. In order that you may all have an understanding of the existing *status quo*, I will briefly refer to what has occurred in the last year, and especially to what happened at our St. Louis meeting, with regard to the reformation of the lines of work of our association and the different affiliated associations.

At the last convention at St. Louis a great deal of the time was taken up with this matter of reorganization and reformation, and different resolutions which are contained in the report of the proceedings of that convention, the report of the Committee on Nominations, and various remarks which are reported in the proceedings, and to which it is not necessary for me to refer at any length, show conclusively not only a desire on the part of every one for a different form of organization, different lines of work, a raising up and broadening out of the work of the associations, but also a feeling and a knowledge that it is necessary that should be done. A most cursory examination of the proceedings of the convention shows that something has been committed to us now to be done and to be worked out.

A year ago last fall I was chosen President of the Association at the meeting at Saratoga Springs, and that was in the natural order of things. But last fall, at St. Louis, after a year of talk and general agitation and after the convention had been held at which new ideas had been discussed and presented, and new policies hinted at, I was re-elected President. It seems to me that my election was not for the purpose of honoring me—it was not for the purpose of establishing a new precedent or drawing a line of difference between myself and the

able men who had preceded me in the Presidential office. It seems to me that it was a unanimous expression on the part of those assembled there that it was time something should be done, and that as the work had come to a head at that time, the re-election of the then President, no matter whom he might have been, was the most emphatic way of expressing the desire for a change.

Every one has been made conversant with the situation. To change things that have been growing for almost twenty-five years is a task that is not without difficulty, and it will have to be proceeded with carefully and deliberately and in the broadest possible way; we must all work together and there must be a giving and taking. There are organizations here to be dealt with that have done good work; they have officers, Presidents, Secretaries, and Executive Committees, and in making changes due regard must be had for all the questions involved; but all, it seems to me, must approach the proposition in the broadest possible way, with an open mind, so that the result which shall be the outcome of our deliberations will commend itself to every one.

A great many of the men who are identified with some of the largest street railway companies in the country have expressed themselves as feeling that the present line and method of work did not justify them in taking an active interest in the affairs of the association. The thing to do is to adopt some kind of a program that will enlarge the field of work, give greater value to it, and which will commend itself to all to such an extent that memberships will be largely increased and revenues increased, so that skilled minds may be brought to the continuous discharge of the work throughout the year. In that way, and that way only, will it be possible to get an organization that will produce such results as the leading technical societies bring about. With all the capital and all the brains we have in the street railway business in this country, we ought to have an association second to none in the value of its work, and certainly there are great problems before the street railway managers of the country and all who are connected with street railway work. If your association and its subsidiary organizations are properly organized in their relations to each other, and the method in which their work is conducted, so that the combined work of all the associations could be handled in the proper way, we ought to get great value from this work.

Coming down to the practical work that is before us, you will pardon me if I first say that my mind is entirely open in regard to these different matters; but, notwithstanding that fact,

I have certain concrete ideas that have been formulated during the past year that I would like to elaborate. Of course, we all know it will be impossible for a large number of individuals to present, in concrete form, so that they may be presented throughout the country to the managing officers of street railway properties and others who are interested in this work, for suggestion and criticism, the lines along which this thing must be worked out. It would seem that after full and free discussion, in which representatives of the different associations shall take part, that then to a small sub-committee ought to be committed the real work. It would seem also that that sub-committee ought to have the assistance of some person of high standing, technical education, a ready writer, a man of good address, one entirely competent in every way to be of the utmost possible assistance. The procuring of such an assistant was authorized by resolution passed at the last convention, whereby the Executive Committee of the parent association was authorized to employ expert assistance and to fix the compensation therefor. Now, with a sub-committee properly constituted, with such an assistant as that, with the proper promulgation of the ideas that underlie the work, with a gathering in of suggestions and criticisms from prominent men and from all who are interested in our work throughout the country, that sub-committee ought to be able, within a reasonable time—because it should enter upon its work at once—to give general circulation to some kind of a plan. That plan being worked over again by the committee, and after being submitted to the Executive Committees of the different associations, could within a very few months be presented to the next convention, and if we were all satisfied and the general opinion was favorable to the plan, possibly the next convention might be held along those lines, and at the next convention a re-drafted Constitution and By-Laws could be adopted and we would hand over to the association at the end of this year a completed plan and a going concern.

That is the line of action that has shaped itself in my mind, and I offer it merely as a suggestion and invite the presentation of views of the gentlemen present. Of course, there is our association, which is called the parent association, the American Street Railway Association; there is the Accountants' Association, and the Mechanics' and Engineers' Association, and these have been formally recognized. Then there is our correlated association, the Manufacturers' Association, which has been organized within the last year. That has also been recognized, and then

there is the Claim Agents' Association. I do not know exactly in what state of formation that association is, but it is in a formative condition in some way, and ought to be dealt with. These are the elements which must be considered. The questions that will come up, to be finally determined and decided upon, I think are present to the minds of every one. I sent out to all those whom I thought would come here today, a suggestion of Mr. Richard McCulloch, of St. Louis, which commended itself to my mind at the time of going over it as a very reasonable thing and one well calculated to meet our wants. Since that time I have given it more study, and I have here a printed copy of a program of the last annual meeting of the American Association for the Advancement of Science, a most cursory examination of which will show that that association is able by its methods of procedure to do about as much work in one year as our association would do in five years. It seems to me to be an excellent thing to serve as a basis to work from. If I should say that I thought it was all right, and that it was what we wanted, it would be entirely contradictory to my first announcement, which was that my mind is wide open. It is wide open, and is not committed to any plan. Whatever is offered as a basis would, of course, be lacking in certain details. The National Electric Light Association has made great advancement in the last few years, and a very excellent provision has recently been adopted in that association, namely, that of creating associate memberships and also individual memberships. It strikes me that feature would be worthy of consideration in reforming our association. It appears too bad that a man who has been the managing officer of a company should lose his membership in any one of these associations of ours simply because he went out of the street railway business, and this applies, of course, equally well to the members of the affiliated organizations. It is unfortunate that one who has occupied a prominent position in our association should not be able to retain membership in the association and in that way keep in touch with its progress, should he so desire. If arrangements were made to cover this feature, an additional source of revenue would also be provided. There are many things like that which will come up. I would like to hear from someone connected with the Accountants' Association.

Mr. W. G. Ross—Mr. Chairman, we would like to hear from some of the members of the Executive Committee of the parent association first, before we give our views, if it does not make any difference; although we are prepared to speak if you wish us.

Chairman Ely called upon Mr. C. G. Goodrich.

Mr. Goodrich—I can only say, Mr. Chairman, that this is the first meeting I have attended in several years, and I have not heard the matter discussed and do not feel well enough informed about it to express an opinion. I will be glad to join in the discussion later.

Chairman Ely—Mr. Richard McCulloch has given a good deal of thought to this matter and we will be glad to hear from him.

Mr. McCulloch—I do not want to impose my views, or present to you the results of the little thought I have given to the subject; but I can state in general terms a plan which I had proposed to Mr. Ely. This Association is founded upon the general plan which the American Association for the Advancement of Science pursues in its meetings. It is composed of college professors and people interested in university matters, very largely. They are men who in the present day tend to give their attention largely to specialties. There will be one professor who is interested in physics, another in mathematics, another in astronomy, etc.; and in the smaller colleges, some of these professors are also interested in and teach several of the different branches, so that in their meetings they have arranged a plan by which men can attend meetings of the sections in which they are interested, and they have also arranged so that sections in which subjects that are correlated are considered meet at different times, so that a man interested in physics and mathematics also can attend the meetings of the two sections, or as many sections as are related to each other.

I sketched out in a general way the different branches into which the specialties in the street railway business might be divided up; for instance, we might start with the heads of the companies, the presidents, directors and managers, and we would say, as an illustration that they are more particularly interested in finance, organization, and legislation, and things of that sort. Then we have the accountants, who have a specialty. Then we have the men who attend to the transportation; the superintendents, and their assistants. Then we have the men who attend to car repairs and electrical repairs. Then we have the men who attend to power plants and the transmission lines. Then we have the engineers who attend to the railways, to the track, and perhaps the buildings and bridges; and then we have the claim agents, who are interested in claims and damages. We might divide these up into a number of different sections and arrange

the meetings so that in a small road the man who perhaps was the superintendent might attend the meetings of the Transportation Section and also the Track and Roadway Section, and in some of the small roads one man is the head of the repair shops and also of the power plant. The meetings of these sections might be arranged so that one man could attend both. It would be largely a matter of arranging the hours at which the sections met, so that they would not conflict.

The general plan which I proposed was that the parent organization should be the leader in all these matters; that when the conventions were called to order there should be first a meeting of the general association, at which there should be the President's address, the address of welcome from the Mayor, the report of the secretary and treasurer, the reports of committees on subjects relating to the routine business of the association, and the appointment of a nominating committee, and that all the general business could be transacted in the morning session, perhaps between the hours of 9 and 12 o'clock. Immediately after that the various sections should have their meetings, and they should meet morning and afternoon for perhaps two days. On the third day the parent organization could meet again and finish up whatever business there was before it.

As to the details of the management of the association, that would involve changes in the constitution and by-laws. I have not attempted to figure that out. That probably would have to be done by the Executive Committee. The general arrangement, I should imagine, would be that the organization should consist of a president, vice-president, an executive committee, a treasurer, and a secretary, which latter official should be a permanent officer and should be the executive member of the organization, and do the work which is usually done by the secretaries of the technical societies. The different sections of course, should have some representation on the executive committee of the general association. My idea was that the president of each of the sections should be a member of the General Executive Committee. As I stated, I have not figured out these details, but I have no doubt that something of the sort could be done. I sketched out in the plan which I turned over to Mr. Ely the amount of business that could be transacted in a three days' meeting, which is the time we now devote to the meeting, and find that under this arrangement there could be six hours for meetings of the general association and

thirty hours for meetings of the sections. Calculating one and one-half hours for the reading and discussion of a paper, time would be provided for the discussion of at least twenty papers, which is four or five times greater than the volume of work which is now accomplished.

Chairman Ely called upon Mr. W. E. Harrington.

Mr. Harrington—I have read the paper which Mr. Ely has referred to, embodying Mr. McCulloch's suggestion in this direction, and have gone over it very carefully. As a plan of organization, I think that without any question it approaches as nearly to that which is in the minds of different members I have spoken to, in regard to the matter, as any plan I have seen presented. The plan of the American Association for the Advancement of Science is one that is very complete, but hardly applies in all its details to the requirements of our association. The plan that Mr. McCulloch has advanced has taken the best elements of the program of the American Association for the Advancement of Science, and the matter now seems to resolve itself into the adjustment of details, which could only be done by the committee as proposed by the President. The arrangement of the details is the essential work before us, following out Mr. McCulloch's plan, and I can only voice your sentiment, Mr. Chairman, to have the matter referred to a sub-committee to work up the details.

Mr. Howard F. Grant—Mr. President, being a new member of the Executive Committee, I endeavored to come to this meeting; and am in the same state of mind as yourself, absolutely receptive. I have had time to give but very little thought to the details of the proposed organization, but have been very much interested in listening to Mr. McCulloch's outline of a plan. It seems to me that if the association and the allied associations are to be of the greatest value to the companies represented in the associations, it is very necessary that we shall have some sort of an organization along the lines suggested and that as soon as possible. It seems also that the association should be so organized that there would be a man at headquarters, an executive officer, who would gather all manner of details in relation to our business, having it on file, getting it from the best authorities and the best practice, and that data should be available for all members of the association and the allied associations. I would like to hear the matter discussed by gentlemen present who have had greater experience than myself, and who have probably given much more

thought to this matter than I have done. I think there is no doubt that it is necessary that a sub-committee should be appointed to take up these matters in detail, thresh them out and make recommendations covering the proposed reorganization. I think that at our meeting here, if we get an expression from the gentlemen who have had experience in controlling the other associations, which are now affiliated with us, it ought to assist us very materially in bringing about a good working organization.

Chairman Ely—I invited Mr. Vreeland, Mr. James F. Shaw and several other gentlemen who have been officially connected with the association in the past to attend this meeting, because they have given quite a good deal of attention to the matter and are thoroughly in touch with the situation; but I think I will save them for the summing up, as it were, so that I will be glad to hear from the Accountants' Association. Mr. W. G. Ross, of Montreal, is the President of that association.

Mr. Ross—I may say at the start that the Accountant's Association is opposed to any change whereby it might lose its identity. I do not mean to say that there is no necessity for a change in the organization of the American Street Railway Association. I think we are pretty well agreed, so far as we have studied the question, that there should be some change. Our members think that Mr. McCulloch's plan has a good many features of value, but we are opposed to being a section of the parent association. We want to retain our identity and we want to retain our name. As you know, we have been in existence since 1897, and we think we have accomplished a great deal. The accounting methods at that time were very crude and they are now very complete. We still have many important questions before us for discussion, the latest being the question of accounts for interurban electric railways, and there are many others.

You all know, also, of the good work that has been accomplished by the Accountants' Association in regard to the State Railroad Commissioners. We have a committee that is in very close touch with these commissioners, some members of the committee being personal friends of the Railroad Commissioners, and our committee is invited to the conventions of the Railroad Commissioners and is on very strong personal footing with the Commissioners. I do not think we should do anything to offset the position which we have reached.

I believe that there is a necessity for a change in some of the methods of work of the association. I quite agree with Mr.

Ely that the subjects at our meetings are not followed up as closely as they might be, on account of subjects coming up which do not interest every one who is at the meeting. I think the street railway business has reached the stage now where there is a necessity to have associations to take up the different departmental work in the street railway field and discuss it more thoroughly than we have been discussing it. I think many believe that the American Street Railway Association should only look after the street railway work in a general way—it should deal with the subjects which relate to the management of the company rather than the practical operation of the road. I think Mr. McCulloch's outline in that respect is very good. I do not agree with him as regards the general secretary having full control of all the sections of the association, because there is a great deal of work—I know this is true as far as the Accountants' Association is concerned—in connection with our association, just as much as one man can handle, and I doubt if it would be a success to have one secretary for six or seven sub-associations or sections. As far as the Accountants' Association is concerned, there is the general work of the secretary, and we have exhibits of forms and blanks, which are continually sent all over the country, which entails a great deal of work in itself as well as keeping track of them and keeping the forms up to date. I think the suggestion of the chairman that a sub-committee be formed to take this matter up is a very good one indeed, and I think it will be productive of good results.

Then there is the question of subscriptions for the purpose of maintaining these associations. Of course, it will be necessary, if the associations are divided into sections, being part of a general association, that there will be only one subscription. While I see many advantages in that, at the same time there are disadvantages and one disadvantage is that the subscription might have to be so large that it would keep out a great many of the smaller companies, and we might lose members instead of gaining them. That is a question which must be studied, no matter whether there is one subscription or several subscriptions. Another important matter to be taken into consideration is the question of individual membership. I think this meeting affords a very excellent opportunity for us to express our views, and I think after the discussion here a sub-committee should be able to study the matter out and submit a satisfactory plan.

Chairman Ely—In regard to the different classes of mem-

bership and the matter of dues, it might be provided that there should be a graduated scale of dues. That plan is followed in the New York State Street Railway Association, so that small companies could become members at a much lower fee than the large companies. It would seem that that matter could be adjusted and arrived at in such a way as to increase the membership and revenues of the association very largely. It seems to me that if our work commended itself to the great corporations in New York, Boston, Chicago, Philadelphia, in fact, to the street railroad corporations of the country generally, that those in charge of these corporations, recognizing the benefits, would be willing to pay more than they do at the present time, and that the lowest admission fee could be adjusted at such an amount as to make it very desirable even to the smallest street railway company in the country to become a member of the association.

Mr. Frank R. Henry—I do not think there is anything additional to be said, on behalf of the Accountants' Association, to what Mr. Ross has said. We all feel, as accountants, on account of the good work we have done in the last seven years, we do not wish to imperil the value of our work through any change which may be adopted. We believe we can do better work if some scheme can be devised whereby our individuality can be maintained. That is the primary thing we have in mind. The other matters of detail could be worked out altogether satisfactorily, but that seems to be the proposition that confronts most of the accountants—they would like the scheme, whatever it is, to be along the lines of maintaining our organization in such way that our contact with the Railroad Commissioners and other organizations in the country would give us the standing which we maintain at the present time.

Chairman Ely—We would be glad to hear from some of the mechanical engineers. Mr. C. F. Baker, of Boston, is president of the Mechanical Association.

Mr. C. F. Baker—It seems to me that part of this plan proposed by Mr. McCulloch is all right. We think our association is different from the parent association or the Accountants' Association—that we are more an association of engineers independent, in a way, from the parent association. Our association, although but little over a year old, is almost self-supporting, but we need more assistance in order to make our association the benefit we would like to see it to the railroad companies we represent and to ourselves. All the members of our association, of

whatever class, are assessed, and the dues at present are as large as is consistent with the income of the average mechanical man. Most of our members belong to other organizations, so that our members are taxed for dues, reports, etc., about as much as they can stand. We, like the Accountants' Association, want to keep our identity; we want our secretary, and we feel that our secretary should be a technical man, familiar with the lines of work dealt with by our association, and should give his undivided time and attention to our work. A president, holding office for one year, cannot give our association the time necessary to make it what it should be and the work should devolve largely on the secretary. I think the matter should be referred to a smaller committee, which can outline what we want and arrive at conclusions better than we can here, where there are so many present. Mr. Adams, of our association, is here and I think possibly he would like to say a word.

Mr. H. H. Adams—I want to bring out the point in connection with the days of the session. Mr. McCulloch spoke of the sessions as being held for three days. If you will recall, at the last two conventions we have held, our Mechanical Association has met two days in advance of the main association. That seems desirable, from our standpoint, particularly in connection with the thought which was brought out in St. Louis, as to the number of men who can get away from a road at one time. It does not seem that it is possible, on some of the smaller roads, to strip the road of all the heads of departments, so that they can attend the convention, and for that reason we set our meetings two days in advance in order that our members could attend the meetings and get back to their work, if necessary, before the president and general manager left for the meeting of the main association. As Mr. Baker suggested our association is in a position where, if we had a greater revenue, we could increase the value of our work, and that has been our principal effort—to increase the revenues. If any financial plan could be suggested to put us on a better basis, it would be of great assistance to us.

The suggestion was made by the chairman about grading the dues. One of the principal objects we had in forming our association was to let the small man have his say. We wanted to let the foreman, if necessary, get up in our meetings and give his experience, without having him feel that he had his general manager around and did not want to talk; and we have made our dues very low, and have several grades of dues. We

feel that we should maintain our individuality in order to accomplish the things we started out to do; and one of our principal objects is to have our association opened to every man who is employed in the mechanical or electrical departments of street railways companies.

Chairman Ely—All these things are interesting and are to the point. They show what we have to deal with, and I would be glad to have the presentation of views go right on. The more we hear the matter discussed, the more we see what is before us. Is there any one here representing the Claim Agents' Association?

Mr. W. A. Dibbs—I represent that association. We formed that association in October, and have a president, vice-president, secretary and treasurer, and an executive committee. We have so far between forty and fifty members. Our dues are small. Of course, we have not spread out very much as yet, as we have only just formed our association. One of the principal objects of our association is to help the members in this way—there are many "repeaters," gangs who go around the country and make it a business to mullet the roads wherever they get an opportunity. The secretary of the association is advised by any members who comes across a case of that kind. The secretary has a pamphlet printed, which is sent to the different members, advising them to look out for such persons. The association so far has had several of these cases, and has saved its members a great deal of money. Another feature of our work is if a member of the association has a case out of town, and he wants some facts looked up, or a witness looked up, or wants an examination made, we help one another in that way. We are out of our swaddling clothes, and in knee breeches. We expect more members to come in.

As to the question which is under consideration, it is new to me. I have not had an opportunity of consulting any of the other members of the association, and cannot give you any expression of their views. I will place it before them. As some of the other gentlemen have expressed themselves, I am sure our association will not want to lose its individuality—we have not an individuality as yet, but we are striving for it. I must beg to be excused from discussing the proposition, for the reason stated, but if there is any assistance which we can give you, we will be glad to render it, heartily, or if there are any suggestions you desire me to place before our executive committee, I will gladly do it

Mr. Adams—I will add a word in connection with the

arrangement of our dues in the Mechanical Association. We have an associate membership which consists of the roads themselves. They pay \$20 a year. We have an active membership, the heads of departments; they pay \$5 a year. Then we have a junior membership, which takes in such men as foremen and mechanical and electrical workers generally, and they pay \$3 a year. I want to bring that point out as illustrating a method which might be pursued in the financial arrangement.

Chairman Ely—While we are all mindful of the fact that many of the things of which we now speak are matters of detail that would naturally work out, still it is very desirable to have them presented at this time because in that way we get an idea of the things that are to be met, and also suggestions as to the manner in which to meet them. It is obvious that if the companies recognize the value of the work, it being taken for granted that what we shall produce will be valuable to the companies, the burden of the support of the aggregate association should rest primarily on the companies. That would relieve just such situations as have been mentioned. Then an arrangement of associate membership would provide for individuals, and those membership fees need not be any greater than those described. If the street railway interests of the country would come forward and take up the association as a valuable adjunct in their work and ally themselves with it, the revenues which would be derived would be sufficient to carry on the work, according to the estimate I have made, in the very best possible way.

We have a number of our friends here who are members of the American Street Railway Manufacturers' Association. Just the part that each one of our organizations will fill is, of course, to be determined, and that very valuable ally, the one that has been in the past the milk in the cocoanut, as it were, is just as much entitled to be heard from now that we are considering how we may take care of ourselves without drawing so much sustenance from that source as if we were intending to take more, so that we would be glad to hear from some one representing that association. Mr. D. M. Brady is the president.

Mr. Brady—I am privileged to serve the committee in an executive capacity. As you know, the welfare of all the organizations connected with the street railroad business is a matter of great interest to us and these organizations have our cordial sympathy and best efforts at all times. As manufacturers, it is our first duty to be nice and pleasant to all our patrons, and I am

sure that I voice the sentiment of every member of our committee when I say that we are in harmony with all of the organizations that are represented here today. What has been accomplished by the Manufacturers' Association in the past year has been the result of the effort of a number of energetic and capable men. Having before us what has been done for the past twenty-one or twenty-two years we are fully of the opinion that as each year goes by, the work of the association will prove more remunerative, not only to the street railways, but to the manufacturers' organizations as well.

Our committee is deeply possessed of a desire that we shall be represented in whatever organization you gentlemen decide upon; and at one of our recent meetings a committee was appointed, the members of which are here today, to confer with your association, Mr. President, for the purpose of having a given number of the members of our Manufacturers' Association, say some part of our Executive Committee, or all of them, if you please, made members, that is, associate members of your association—meaning by that that they would have no vote on the question of the expenditures of money, or the standardization of your properties, but on all questions which pertained to exhibits and other matters of detail in connection with conventions, we would be fitly represented. As I say, we appointed a committee, which is here today to act in harmony with your wishes, so far as you may desire. Probably, when the sub-committee is appointed, to which the chairman referred in his opening remarks, you may consider it wise to have a sub-committee from the Manufacturers' Association as part of the general sub-committee.

Let me say that so far as the Manufacturers' Association is concerned, they have no friends to reward or enemies to punish; no fads or fancies of any kind. I am sure every member of the association will be very glad to work in complete harmony with your organization. Above all things, no matter what the individual views may be of different members of the American, the Accountants', the Mechanical, and the Claim Agents' Associations, we, as manufacturers and supply men, want to be nice and friendly with you all.

If you will pardon a personal allusion, I would like to say that for many years I was secretary of the Master Car Builders' Association, from 1877 to 1883. That was during the period in which the present grand association was built up. That association has what is known as a road membership; each road pays

\$5 per year for each 1,000 cars, or the major part of 1,000 cars, which they may own. For example, if the Pennsylvania Railroad Company owns 100,000 cars, or 99,600 cars, they pay a membership fee of \$500 per year. In addition to that, the individual members pay an annual fee of \$5. All of that money is expended for the legitimate purposes of forwarding the work of the association. As is generally known, they have a secretary who is a man of considerable capacity, who devotes his entire time to the work of the society, and there is no doubt but that in the matter of the interchange of cars and the standardization of equipment they have saved the steam railroads of this country in the last twenty-five or twenty-six years, many millions of dollars. In the year 1874 it was not possible for a freight car to leave the city of Boston, en route for Chicago, and arrive in Chicago without passing 21 different sets of inspectors. You can imagine what a constant snarl the interchange of cars was in those days. Today there is a joint inspector at Albany, Buffalo, Detroit, and at every important point, who represents all the companies, and there is not the slightest difficulty under this present system in shipping freight from an extreme eastern point to an extreme western point.

Through the courtesy of the president I have been furnished a copy of Mr. McCulloch's paper and have looked it over carefully in accordance with his request that some suggestion might be had from me; and I want to say that I think Mr. McCulloch's paper is founded upon the best possible lines. The amount of work that has been accomplished at the street railway conventions in recent years has not been at all satisfactory. The convention at St. Louis was the most successful one, and a great deal of good work was done there, but there have been several conventions in recent years at which there was very little work accomplished. I am merely calling attention to that fact for the purpose of emphasizing Mr. McCulloch's position, which is that we do not work hard enough or long enough. At the convention of the M. C. B. Association, held in Chicago in 1879, which was one of the most important ever held by the association, we were there one solid week. In four days we had ten sessions, including two night sessions. The total amount of work that was put in by the members was 34 hours, and I can assure you, gentlemen, that a great deal of valuable work and much good was accomplished in behalf of the steam railroads of the country.

I want to emphasize once again the matter of the amount of

work which such an association should do, by saying that the standardization of your equipment and the standardization of all the methods which go to make up a successful street railway will certainly take up more than one or two days of any meeting in any year, and I question very much whether Mr. McCulloch has even allowed time enough in making a three or four days' session, with a possible 30 to 36 hours of work—I question whether he has allowed time enough, even at that.

Chairman Ely—We are glad to hear from Mr. Brady and will be glad to hear from other members of his association.

Mr. Brady—With your permission, I would like to call on some of the members of our Executive Committee, who represent the technical press, who are present today, and I know they will have something to say that will enlighten us on the subject.

Chairman Ely—I note that you have included in the membership of the Supply Men's Association those who supply us with interesting literature pertaining to our business and I am glad to call upon Mr. J. H. McGraw, of the Street Railway Journal.

Mr. McGraw—Mr. Chairman and Gentlemen: I do not know that there is much that I can add to what has already been said. I believe that there is a psychological moment for almost everything that is good in this world, and I further believe that the psychological moment in the history of the American Street Railway Association, and the allied associations, is now upon us. I have heard this matter of reorganization discussed for four or five years, quite strenuously in some quarters. The first efforts at reorganization were at the Montreal convention, in 1895; and the thought of making changes in our methods of work has been uppermost in the minds of some of our members for at least five or six years past. As the chairman has very truly said, the men who manage the railways of this country have brains and ability, and it is simply a question of their rising to the opportunity which now presents itself. In my opinion, the American Street Railway Association ought to be one of the foremost, if not the foremost, of the technical and scientific bodies in the United States. There is no reason why it should not be, and the time has come to put the methods into operation which will bring that about. There is a need for it; there is a great work to be accomplished, and I believe that we are now finally on the right lines to bring about the results. Of course, the work needs to be done in a broad-gaged way, and the foundations, as I see it, are already laid. The association has a history behind it now of some twenty-

one or twenty-two years, and a great deal of good work has been accomplished, as a whole. Of course, the conditions in the street railway business have entirely changed in the last ten years. It is true that there have been some conventions that were not up to the mark, set by other conventions, but at the same time much good has been accomplished and the foundation is here now upon which to build a superstructure and that superstructure should now be built. I have not gone into the matter as to how it should be worked out in detail, but I have read with much interest the suggestions in the paper of Mr. McCulloch, and they seem to me to be along right lines. It seems to me, too, that it is not necessary for the Accountants' Association, the Mechanical Association, or the Claim Agents' Association, to lose their identity in becoming a section or integral part of the American Street Railway Association. I feel sure that this committee, which has been suggested by our chairman, when it is appointed and works out a plan, that such a plan will so shape itself that these different allied associations will be perfectly satisfied. I would not for a moment think it wise to curtail the work of the very important Accountants' Association or that of the Mechanical Association or the Claim Agents' Association. They have done most excellent work. The Accountants' Association is today recognized throughout the whole country as having done a work in systematizing and putting in shape the accounts of the street railroads of the country, which is of the very greatest value. These accounts are now kept in very different and very much better shape than they were when that organization was brought into existence. I think we are working along right lines. I think this committee will work out a plan satisfactory to all, and I am sure, as representing the technical press, that we are with you in your efforts, and we will do all we can in the way of co-operation, and give the best publicity, the best of our efforts, in the direction of giving useful information to the members.

As a member of the Executive Committee of the Manufacturers' Association I can only say that from my point of view I look on that association as simply one of the aides to the American Street Railway Association, and the policy laid down by this committee for the Manufacturers' Association would, of course, be followed by that association. I thank you.

Mr. William Wharton, Jr.—I think the gentlemen who have spoken for the Accountants' Association and the other allied associations need not be in the least afraid that any efforts will

be made in these plans for reorganization which will cause them to lose their identity or weaken or injure their position in any way. I believe if a combination in some way can be made of the talent and brains of the members of the different branches, such a combination will be greatly beneficial and will not cause injury in the least to any of these interests. The identity of these associations should be preserved and I have no doubt that the report of the committee, which I hope will be appointed, will be to the effect that these separate organizations shall be preserved, but that they are all to work together. "United we stand"—I will not say "divided we fall"—but united we stand, and we will all be strengthened.

As representing the Manufacturers' Association, to a certain extent, as I am on the Executive Committee, I would like to say, as a member of that association and as an individual, that I consider it an honor and a great privilege that the members of that association should in some way be allied to your parent association. We are not afraid that you will not treat us with justice and with propriety. We want to come in with you. We want to help you, and if you can help us, we will be only too thankful to have the help. I attended the conventions of the American Street Railway Association as a delegate for a number of years in times gone by, when I was associated with several street railway companies. Of late years I have tried to be on hand as representing our manufacturing companies. It has always been a source of great pleasure and instruction to me to attend the meetings, and I have only regretted that our relations have not been closer, and that we have not been more closely associated with you in every way. I approve of the appointment of this committee. I believe they will be able to formulate a plan which will be just and satisfactory in every way. I will give it my hearty support, and I have no doubt that every one of our members of the Manufacturers' Association will also approve of it.

The point I wish to bring out is that we certainly—and I really feel that the other allied associations have the same desire—want to be with you; in some way we want to be a part of you. No matter how humble a position it may be, we are willing to take what you will give, believing you will treat us properly. We want to be a force to help you. We want to join with you and feel that we are affiliated with you and that when we go to conventions we are not outsiders, without any privileges. We do

not feel that we are an outside class, but we want some distinct affiliation with you.

Chairman Ely—I am very glad indeed to hear from Mr. Wharton. You all know that he is one of the Nestors of the street railway supply business, and I am sure we all appreciate Mr. Wharton being with us. We are also obliged to Mr. Dibbs for being present and telling us about the status of his association; and at the same time I want to remark that it is a good illustration of the necessity for closer co-operation between these various associations. The fact that the Association of Claim Agents was formed and no official cognizance was taken of it by the parent association is a strong commentary in favor of our present plans. If we were separate train units, there would be many collisions between us, but fortunately we are not running upon any fixed track. There could be no better illustration than that of the necessity of changing the present methods of procedure. Mr. F. S. Kenfield, of the Street Railway Review, is present, and we would like to hear from him.

Mr. Kenfield—As I came in very late, having just arrived, and not having heard all the speeches, I do not think I am in a position to say very much in reference to these matters. As publishers, however, and being familiar with a number of associations, we agree with Mr. McCulloch that new methods could be introduced in the work of the association to great advantage; whether the allied associations should do their work independently is a question. It may be that the best results would be secured by having each of the allied associations conduct its work somewhat as now, with a general supervision of all the work on the part of the parent association. I agree with Mr. Wharton that we should have a common cause and the members of the Executive Committee should work together for the best interests of all.

Chairmen Ely called upon Mr. Newcomb Carlton, of the Westinghouse Electric and Manufacturing Company.

Mr. Carlton—I am obliged for the opportunity of meeting you all, but I am sorry to say I have no suggestions to make, because I really do not know what the discussion is about. I have only just recently entered the room and have not heard sufficient of the discussion to say anything about the matter. The saying is that that would qualify a man to express a very profound expert opinion on a subject, but in my case I am going to take advantage of the opportunity to remain here and learn.

what is going on, and then if I have any suggestions to make I shall take the opportunity of making them later.

Chairman Ely then called upon Mr. C. C. Peirce, of the General Electric Company.

Mr. Peirce: Most of those present know that I have been interested in the work of this association for a number of years. The problems which we are discussing do not strike me as being half as serious as we seem to think them. I think Mr. McCulloch's plan is a very good one on which to build a method for prosecuting the work of the association. In my opinion, it is largely a question of detail. I do not think it makes any difference whether you call the allied associations departments or sections, or whether you call them associations. The identity of the associations will be maintained, and even if the associations should be known as sections, those men who are now active in the separate associations would be active in the sections, as each section would necessarily have an organization of chairman, secretary and other officers and committees. The suggestion which was made at St. Louis, of having the presidents of the various allied associations members of the Executive Committee of the American Street Railway Association is a good one and it would tend to bring the associations into closer touch. To my mind, the difficulties which surround this plan are matters more of detail than substance, and I think when the special committee starts in to do its work it will find a way to arrange the matter harmoniously.

Chairman Ely—We would be glad to hear from Mr. Vreeland. I believe he has given this matter some thought, and what he has to offer is always entertaining and valuable.

Mr. H. H. Vreeland—I have been out of the city making some investigations and have not had an opportunity to read what Mr. McCulloch suggests. I would like to ask if it was intended by his plan that there should be any loss of identity of these various associations, or if they are to be branches of the main organization?

Mr. McCulloch—That was not contemplated—no loss of identity.

Mr. Vreeland—As far as the broad general proposition is concerned, I have talked about this matter with the members of the Executive Committee of this association for a number of years. It occurred to me some time ago that the work of the association was not of a character to be the most valuable to the

membership of the association. I once said that we had departed from the horse-car methods of our business in every respect but as regarded the American Street Railway Association—that there had been no change in the method of conducting its business since its organization. You can look back over its history and you will find that it has not been as progressive in keeping abreast with the changes in the business methods of the street railways of the country as it should have been. We have changed from horse-car days to a character of work that requires technical ability and expert men in all branches of the business.

The work which this association is now about to undertake has gone on for the last twenty-five years in connection with steam railway work. Years ago I was a member of what was known as the old general Time Convention, which is now the American Railway Association, and that was recognized, as it is today, as representative of the American steam railroads. There are many branch organizations—the North American Society of Railroad Superintendents, of which I have been a member for many years; the American Road Masters' Association, the Train Dispatchers' Association, and other associations of a similar character. Then there is the Master Car Builders' Association and the American Railway Master Mechanics' Association, which are recognized by the railroads because of the fact that the associations adopt standards for railroad work. In all other organizations a man can belong to as many as he likes; it is an individual proposition; but the American Railway Association is composed of a membership of the railroads, and not individuals.

Association work in our business has become rather diversified, and the character of information required of the associations, as a whole, is of a character which cannot be gotten by these various organizations working independently of each other. There is an interdependency between the various departments, which requires closer affiliation of these associations. The first point I brought up in connection with this a few years ago is the fact that there is no center of information in connection with the operation of the street railroads of the country. For instance, I may receive today a typewritten form from the West, on which a request is made that certain statistics should be given. It is referred to one of our departments, and that information is given. Tomorrow I may get a request from the East, for information bearing upon the same thing. That information is furnished, and the next day I may get a similar request from Canada.

These requests relate to the subject of transfers, general mechanical questions, the use of steel wheels, and things of that character. That is something that never occurs in connection with steam railroad work, for the reason that the steam railroads have a centre of information where such questions can be answered officially. That was my first recommendation in connection with the work of this association—that there should be some central point with a secretary who was properly technically equipped, and had a statistical turn of mind, to gather this information instead of the railroads writing all over the country and asking for this information, and frequently telegraphing for it. I had a man telegraph me a "rush" message, answer at his expense, from the West, as follows: "Common Council meets tonight; do you advise that we go into a general transfer system? Answer quick." Within the past two weeks I received a telegram about as follows. "We are about placing an order for wheels. Will you please say whether we shall adopt steel tired or the chilled wheel? Answer at our expense at once." Questions of that kind coming up in connection with this business show the necessity of there being some central point for this information.

So far as the question of how this new method shall be proceeded with and how it shall be worked out I cannot see where there is any danger of any of these various organizations that now have a separate identity losing anything they have by an arrangement of this character. There is nothing novel in the idea. One of the greatest organizations ever formed in the history of labor is based exactly on this plan, and in the formation of that organization we had the advice of some of the most expert men in the United States. There is one central organization, which is the executive head, and there are a number of branches. I am chairman of a branch that takes in practically the whole of the United States—it has its own name, but it is a branch of the main organization. There are now five branches throughout the United States, every one of them a part of the main organization; they are presided over by chairmen, and each one of the chairmen is a member of the Executive Committee of the main association. The same thing is true about steam railroad work. Does any one who has any knowledge of the workings of the Master Mechanics' or Master Car Builders' Association think there is any loss of identity in their case because they are known as a part of the American Railway Association? There cannot be any loss of identity of our allied organizations, in my opinion, through a

closer affiliation with the parent organization, and it seems to me that unless some method is devised by which the contribution of the railroad companies is given to a central organization, rather than to a number of independent organizations, there is a possibility of the railroad companies drawing the line at one association and saying that if their men want to be members of various organizations they will have to take such membership as individuals, independently of the railroad company.

I have thought a great deal on this subject and brought the matter up a number of times in the last three or four years, and I feel that the time has come in the history of the American Street Railway Association when it has either got to go forward or backward, and in my opinion the committee which it is proposed to appoint can arrange a scheme of organization through which the American Street Railway Association will be the principal body, but these branch associations, departments or sections, or anything else you wish to call them, will preserve their identity exactly as it existed in the past few years, and, in fact, have a great deal better standing among the railroads of the United States because they are a part of the American Street Railway Association, rather than independent organizations. I do not think I would care to devote my time, or the time of the men connected with the technical departments of my company, in going on with the American Street Railway Association, an association representing as important an industry as the street railways of the United States, unless there is a complete change in its method of handling its business; nor do I think I would care to have my mechanical and technical organizations, the heads of departments of my company, split up into a number of associations that were working on their own hook, any more than I would care to have all my departments working independently of the President of the company.

Chairman Ely invited Mr. James F. Shaw to discuss the subject.

Mr. Shaw—I have listened with a great deal of interest to the remarks made this morning, and it seems to me that there is an air of business about this meeting I have never seen before, either in a meeting of the Executive Committee or of the association. I read with a great deal of interest the plan as outlined by Mr. McCulloch and think it has a deal of merit. I also think that the views as expressed by the members representing the several auxiliary associations are entitled to a great deal of con-

sideration. I think that the plan suggested by you, Mr. Chairman, in having the matter referred to a sub-committee will be the means of working out something which will be satisfactory to all interests and bring forth the results which we are all looking for—that is, that which is for the best good of the operating companies.

Chairman Ely—I have a letter bearing on this subject. The writer of the letter requests that there shall be no publication of it. It treats of the situation which confronts us and shows how deep the feeling is that there is need for a change in our methods. I agree with Mr. Peirce that the situation is not serious, for the reason that it is evident from what has been said here today that everybody believes, as Mr. McGraw said, that the psychological moment has arrived when the change would be made. We are all fully impressed with the importance of the situation; we are going to do business, and I am sure we will evolve some plan that will meet with the approval of all concerned. This letter is from one of the most eminent men in the business and expresses his views on the question which we are considering. (Mr. Ely read the letter.)

I think perhaps we have had enough discussion upon the question; the more we have talked the more apparent it has become that we are substantially in accord. Our talk has served to clear up the situation. The committee which is to be appointed should, of course, be large enough to be representative, yet small enough to do business, and the members of the committee should be located territorially so as to admit of their being gotten together with the least expense. The committee will have to work and have paid assistance that will be provided by the Executive Committee of the parent association, under the authority conferred at St. Louis.

Mr. Goodrich—I suggest that a member of each one of these associations be appointed on the committee and that the associations themselves appoint their representatives.

Mr. Wharton—I think there should be two members on that sub-committee from each organization. I think it would be advisable to have two members so that one may consult with the other.

Mr. C. C. Peirce—How many would you suggest from the parent organization?

Mr. Goodrich—I think four would cover the ground.

Chairman Ely—That would be eight from the outside organizations and four from the parent association. I have had some

experience in trying to get the members of committees together in the last few years, and if there are eight from the outside organizations and four from our association that would make a committee of twelve. It would be very difficult to get them all together at one time, and when you do get twelve men together you have quite a large meeting. If there was one member from each of the affiliated organizations, if any question arose, he could advise with the Executive Committee concerning it. If we commence work right away we will have plenty of time in which to attend to it, and if any question arose about which a member of the committee wished to consult his executive committee there would be time for him to do it.

Mr. Wharton: I withdraw my suggestion of two from each of the auxiliary associations, as I think your reasons are good. I think one from each of the auxiliary organizations and four from the parent organization, making eight in all, will be sufficient.

Mr. Peirce—I would make a suggestion that the committee be composed of one member from each of the auxiliary organizations, and that an alternate be also appointed, so that the association will be certain to be represented when the committee meets.

Chairman Ely—As the matter now stands, that would be four committeemen from the subsidiary organizations, with four alternates, and four from the parent organization; the alternate to be called upon in case the principal could not attend.

Mr. Wharton—I make that motion, Mr. Chairman. (The motion was put and carried.)

At an adjourned meeting held on Saturday morning the following gentlemen were announced as composing the sub-committee to devise ways and means for the reorganization of the American Street Railway Association and to determine the manner in which the subsidiary organizations should be affiliated; the committee to report later:

For the American Street Railway Association: E. C. Foster, New Orleans; Richard McCulloch, St. Louis; C. G. Goodrich, Minneapolis; W. E. Harrington, Camden, N. J.

For the Accountants' Association: W. G. Ross, Montreal, and Frank R. Henry, St. Louis, alternate.

For the Mechanical Association: H. H. Adams, Baltimore, and E. W. Olds, Milwaukee, alternate.

For the Claim Agents' Association: W. A. Dibbs, New York, and W. H. Renaud, New Orleans, alternate.

For the Manufacturers' Association: W. H. Heulings, Jr., Philadelphia, and William Wharton, Jr., Philadelphia, alternate.

On motion Mr. Ely, President of the American Street Railway Association, was requested to act as chairman of the Joint Committee, *ex-officio*.

On motion the matter of making arrangements for expert assistants to serve the committee was referred to Mr. Ely.

JOINT MEETING OF THE EXECUTIVE COMMITTEE OF THE  
AMERICAN STREET RAILWAY ASSOCIATION AND REP-  
RESENTATIVES OF THE AFFILIATED ASSOCIA-  
TIONS, HELD AT THE BELLEVUE-STRATFORD,  
PHILADELPHIA, JUNE 12 AND 13, 1905.

The following representatives were present:

For the American Street Railway Association: President Ely, Mr. John J. Stanley (in place of Mr. E. C. Foster), Mr. John I. Beggs (in place of Mr. Richard McCulloch), Mr. C. G. Goodrich and Mr. W. E. Harrington.

For the Accountants' Association: Mr. W. G. Ross.

For the Mechanical Association: Mr. H. H. Adams.

For the Claim Agents' Association: Mr. W. H. Renaud.

For the Manufacturers' Association: Mr. Wm. Wharton, Jr

There were also present the following named gentlemen: Messrs. John B. Parsons, John Grant, C. C. Peirce, James H. McGraw, E. H. Baker, D. M. Brady, H. W. Blake, Samuel Curwen, H. J. Kenfield, E. M. Williams, George Keegan, Newcomb Carlton and Professor H. H. Norris of Cornell University.

Professor Norris presented his report on the reorganization of the American Street Railway Association.

REPORT OF PROFESSOR HENRY H. NORRIS.  
INTRODUCTION.

The following report has been prepared in order to place in convenient form for reference the results of the study made of various organizations. From this study the suggestions in the proposed Constitution are a natural result. This survey includes all of the Associations which would apparently assist in the work and some have been included in the hope of aiding in future enlargement of the scope of the Association. For example, the constitution of the Bankers' Associations is digested here in order to show one method of dividing and sub-dividing the work in order to secure convenience to the members and continuity of interest.

In order to facilitate the use of the report, the subjects which naturally fall together are arranged in groups with corresponding numbering. The Bankers' Associations, being quite different in plan and scope are placed at the end of this section of the report.

The Criticisms and Comments upon this report are found in a supplementary report entitled "Criticisms and Comments."

It is suggested that the plans of affiliation here recommended may in time be extended so as to include the State Associations

and the plan of organization is such that such extension is possible without modification of this Constitution and these By-Laws.

HENRY H. NORRIS.

Ithaca, June 7, 1905.

#### ANALYSIS OF THE PURPOSES AND PLANS OF ORGANIZATION OF VARIOUS ASSOCIATIONS.

This study has been made for the purpose of assisting in the preparation of a plan of re-organization of the American Street Railway Association which shall be based upon the combined experiences of all other associations which have had and still have problems to solve similar to those met with by this Association. The plan of procedure was to first gather together the literature of the following associations:

1. American Street Railway Association.
2. American Railway Mechanical and Electrical Association.
3. American Association of Street Railway Claim Agents.
4. Street Railway Accountants' Association.
5. New York State Street Railway Association.
6. American Railway Association.
7. American Railway Engineering and Maintenance of Way Association.
8. Master Car Builders' Association.
9. American Railway Master Mechanics' Association.
10. International Tramways and Light Railways Association.
11. American Association for the Advancement of Science.
12. National Electric Light Association.
13. American Bankers' Association.
14. New York State Bankers' Association.

This literature was carefully read and analyzed and the following digest was prepared.

#### Arrangement of Analysis of Constitutions and Methods of Working of Various Associations.

- a. Object:
- b. Means of attaining same:
- c. Members:
- d. Privileges of same:
- e. Officers:
- f. Meetings:
- g. Lines of work undertaken:
- h. Dues.

**Object and Means of Attaining Same.**

American Street Railway Association. Present Organization.

1. a. Object:—

“The acquisition of experimental, statistical and scientific knowledge, relating to the construction, equipment and operation of street railways, and the diffusion of this knowledge among the members of this Association, with the view of increasing the accommodation of passengers, improving the service and reducing its cost; the establishment and maintenance of a spirit of fraternity among the members of the Association by social intercourse, and the encouragement of cordial and friendly relations between the roads and the public.”

1. b. Means of attaining same:

By annual conventions at which practical and scientific papers are presented and discussed and at which a spirit of fraternity is developed by the work of special committees which operate to standardize the various elements of electric railway practice.

Among the committees doing work of a nature especially in accord with the purposes of a national organization may be mentioned:

THE COMMITTEE ON COMPENSATION FOR CARRYING THE UNITED STATES MAIL. This committee is keeping before Congress the necessity of an equitable sliding scale of rates and they are meeting with encouraging success.

THE COMMITTEE ON RULES FOR CAR WIRING AND EQUIPMENT FOR THE CARS. By co-operation with the Underwriters National Electric Association a reasonable code of rules is being developed to the satisfaction of all parties concerned.

THE COMMITTEE ON RULES FOR THE GOVERNMENT OF CONDUCTORS AND MOTORMEN. This committee in conference with the N. Y. State Street Railway Association (which has a similar committee) and the New York State Board of Railroad Commissioners has framed a set of rules which meets with general approval. These rules will be revised from time to time.

THE COMMITTEE ON MEMORIALS, as the name indicates, has the duty of preparing suitable notice of the life and work of deceased members of the association.

American Railway Mechanical and Electrical Association. Present Organization.

2. a. Object:—

The acquisition of experimental, statistical, scientific and

practical knowledge relating to the construction, equipment and operation of street and interurban railways."

2. b. Means of attaining same:—

An annual convention for the discussion of practical subjects connected with the equipment of electric railways including motive power, rolling stock, transmission and maintenance of way.

A question box, a feature which is becoming an important adjunct to the work of all associations. Questions and answers are published in the proceedings and are discussed at conventions.

Standing Committees will be a feature, the purpose of these being apparently similar to that of the similar committees of the Master Car Builders' Association. Following are the present standing committees:

STANDING COMMITTEE ON CONTROLLING APPARATUS.

STANDING COMMITTEE ON BRAKES.

STANDING COMMITTEE ON WHEELS.

STANDING COMMITTEE ON SHOPS.

STANDING COMMITTEE ON TRACK.

American Association of Street Railway Claim Agents. Present Organization.

3. a. Object:—

The mutual protection of street railway companies from fraudulent claims; for accumulating other information about claims; and for assisting in the investigation and adjustment of out-of-town matters.

3. b. Means of attaining same:—

By interchange of such information from one company to another through the office of the secretary.

By conventions held for the discussion of matters connected with claims and for the promotion of good fellowship among claim agents.

Although formed but last year the association is already finding work to do in protecting its members from fraudulent claims and in assisting in claim adjustments.

Street Railway Accountants' Association.

4. a. Object:—

To bring together those engaged in the accounting departments of the street railway companies, for the interchange of ideas, to promote the adoption of a uniform system of accounts, and to improve the work of the accounting department.

## 4. b. Means of attaining same:—

By annual conventions for discussion of papers and by standing committees. The following committees deserve special notice:

STANDING COMMITTEE ON A STANDARD SYSTEM OF STREET RAILWAY ACCOUNTING. This committee has prepared a complete system which was officially adopted in 1899 and is now standard. The committee answers by mail numerous questions relating to its specialty and suggests revisions from time to time based upon actual experience with the system.

JOINT COMMITTEE (with American Street Railway Mechanical and Electrical Association) ON BLANKS FOR SHOP RECORDS AND ACCOUNTS. A large collection of blanks has been prepared and is maintained and revised.

New York State Street Railway Association.

## 5. a. Object:—

The acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of street railways and the diffusion of this knowledge among the members of this association with the view to increasing the accommodation of passengers, improving service and reducing the cost; establishment and maintenance of a spirit of fraternity among the members of the association by social intercourse; and the encouragement of cordial and friendly relations between the roads and the public."

## 5. b. Means of attaining same:—

By means of an annual convention at which papers are presented.

By means of special committees appointed to investigate particular problems.

As representative of the work of the association the following committees are typical:

STANDING COMMITTEE ON RULES FOR THE GOVERNMENT OF CONDUCTORS AND MOTORMEN. In co-operation with the New York State Board of Railroad Commissioners this committee has prepared a complete Code of Rules, including special rules for the crews of interurban cars.

SPECIAL COMMITTEE ON DANGERS INCIDENT TO HIGH VOLTAGE POWER TRANSMISSION LINES. This committee made a series of tests and based recommendations thereon.

**American Railway Association.****6. a. Object:—**

The discussion and recommendation of methods for management and operation of steam railroads.

**6. b. Means of attaining same:—**

While an annual convention is held the important work consists of the operation of standing committees. These committees are very active and accomplish definite results. The present committees are as follows:

COMMITTEE ON TRAIN RULES.

COMMITTEE ON CAR SERVICE.

ARBITRATION COMMITTEE.

COMMITTEE ON SAFETY APPLIANCES.

COMMITTEE ON STATISTICAL INQUIRY.

COMMITTEE ON STANDARD DIMENSIONS OF BOX CARS.

COMMITTEE ON METRIC SYSTEM.

COMMITTEE ON STANDARD CIPHER CODE.

**American Railway Engineering and Maintenance of Way Association.****7. a. Object:—**

"The advancement of knowledge pertaining to the scientific and economical location, construction, operation and maintenance of railroads."

**7. b. Means of attaining same:—**

Meetings for the reading and discussion of papers and for social intercourse.

The investigation of matters pertaining to the objects of this Association through Standing and Special Committees.

The publication of papers, reports and discussions.

The maintenance of a library.

The systematic arrangement of committee work in this association is especially commendable. The committees are chosen systematically and their work is definitely prescribed. These committees as a whole are intended to maintain a complete code of specifications for the location and construction of steam railroads. The sixteen standing committees are as follows:

1. ROADWAY.
2. BALLASTING.
3. TIES.
4. RAIL.
5. TRACK.

6. BUILDINGS,
7. WOODEN BRIDGES AND TRESTLES.
8. MASONRY.
9. SIGNS, FENCES, CROSSINGS AND CATTLE-GUARDS.
10. SIGNALING AND INTERLOCKING.
11. RECORDS, REPORTS AND ACCOUNTS.
12. UNIFORM RULES, ORGANIZATION, TITLES, CODE,  
ETC.
13. WATER SERVICE.
14. YARDS AND TERMINALS.
15. IRON AND STEEL STRUCTURES.
16. ECONOMICS OF RAILWAY LOCATION.

Master Car Builders' Association.

8. a. Object:—

"The advancement of knowledge concerning the construction repair and service of railroad cars, by discussions in common, investigations and reports of the experience of its members; to provide an organization through which the members and companies they represent, may agree with such joint action as may be required to bring about uniformity and interchangeability in the parts of railway cars, to improve their construction, and to adjust the mutual interest growing out of their interchange and repair; but the action of the Association shall have only a recommendatory character, and shall not be binding upon any of its members or the companies represented in it."

8. b. Means of attaining same:—

This association holds an annual convention where discussions upon reports and topical discussions are the main features. The association owns apparatus for making tests which are used by committees.

A COMMITTEE ON SUBJECTS selects and recommends subjects for committee work and for typical discussions at conventions. The standing and special committees have very specific duties and by this means standard construction and interchangeability of parts have been agreed upon and very generally adopted.

The REPORT ON STANDARD AND RECOMMENDED PRACTICE, frequently revised, is a model of such work as are also those on

AIR BRAKE AND TRAIN AIR SIGNAL INSTRUCTIONS, RULES FOR LOADING LONG MATERIALS on open cars and many others. The following list of committees indicates the gen-

eral line of work carried out. Many of these committees carry on experimental work and the association owns apparatus for some of these.

COMMITTEE ON AIR BRAKE HOSE.

COMMITTEE ON ARBITRATION.

COMMITTEE ON BEST PREVENTIVE OF RUST ON STEEL CARS.

COMMITTEE ON BRAKE SHOE TESTS.

COMMITTEE ON CAST-IRON WHEELS.

COMMITTEE ON CAST-IRON WHEELS, SPECIFICATIONS, RECOMMENDED PRACTICE.

COMMITTEE ON COUPLING CHAINS.

COMMITTEE ON DRAFT GEAR.

COMMITTEE ON LOCATION OF THIRD RAIL FOR ELECTRICAL OPERATION.

COMMITTEE ON OUTSIDE DIMENSIONS OF BOX CARS.

COMMITTEE ON PRICES FOR REPAIRS OF STEEL CARS.

COMMITTEE ON REVISION OF STANDARDS AND RECOMMENDED PRACTICE.

COMMITTEE ON RULES FOR LOADING LONG MATERIALS.

COMMITTEE ON STAKE POCKETS.

COMMITTEE ON STEAM LINE CONNECTIONS.

COMMITTEE ON STENCILING CARS.

COMMITTEE ON SUBJECTS.

COMMITTEE ON TANK CARS.

#### Master Mechanics' Association.

##### 9. a. Object:—

The advancement of knowledge concerning principles, construction, repairs and service of the rolling stock of railroads; by discussions in common; the interchange of information and investigation of reports of the experience of its members; and to provide an organization through which the members may agree upon such joint action as may be required to give the greatest efficiency to the equipment of railroads entrusted to their care.

##### 9. b. Means of attaining same:—

The character of work done by the committees of this association may be judged by the following subjects of investigation by such committees: automatic stokers; boiler designing; coal consumption of locomotives; correspondence and resolutions; cost of locomotive repair shops; locomotive driving and track axles

and locomotive forging; locomotive frames; locomotive front ends; painting locomotives; piston valves; revision of standards; safety appliances on locomotives; ton mile statistics.

The work of the association is laid out systematically for the year so that the annual convention is the occasion for the reports of these committees which are based largely upon practical tests. Among other topics which are being considered by committees during the current year, the following may be mentioned particularly relating to locomotives: Locomotive tests of Pennsylvania Railroad Company at St. Louis Exposition; shrinkage allowance for tires; motive power terminals; flexible stay balls; water softening for locomotive use; service of locomotives, shop lay-outs.

This association is very closely affiliated with the Master Car Builders' Association, and the greatest care is taken to divide the field equitably between the two associations. They have the same permanent secretary, who very vigorously follows up the work of both associations. He is permanently located at Chicago. The proceedings, as well as those of the Master Car Builders' Association, are volumes of considerable size, this one being of nearly six hundred pages. These are securely bound in half leather and are models of their class. It will be noticed that the Master Mechanics' Association concerns itself particularly with the motive power department while the Master Car Builders' take care of the other rolling stock. Among other interesting fields of this association is one which is unique. This is the maintenance of four scholarships in the Stevens' Institute of Technology and one at Purdue University.

It should be remarked that among all of the associations of a practical technical character, this one is the most noteworthy.

#### International Tramway and Light Railway Association.

##### 10. a. Object:—

To acquire and disseminate among its members accurate information in regard to those questions affecting the economical operation of street and light interurban railways; the establishment and maintenance of a spirit of fraternal interest among its members.

##### 10. b. Means of attaining same:—

By means of biennial conventions held in different European cities at which are discussed questions which have been submitted to the members for answer and comment. In this way the

answers possess the qualities due to mature deliberation and they also have the vitality which follows from the discussions in the conventions. These answers with the discussions are published in three languages so that all members may follow the work with ease.

American Association for the Advancement of Science.

11. a. Object:—

The objects of the Association are: by periodical and migratory meetings to promote intercourse between those who are cultivating science in the different parts of America, to give a stronger and more general impulse and more systematic direction to scientific research and to procure for the libraries of scientific men increased facilities and a wider usefulness.

11. b. Means of attaining same:—

In attaining the desired objects the principal feature is the holding of such meetings as shall be possible for the presentation of papers and for discussions. The association is divided into the following sections:

- (a) Mathematics and astronomy.
- (b) Physics.
- (c) Chemistry, including its application to agriculture and the arts.
- (d) Mechanical science and engineering.
- (e) Geology and geography.
- (f) Zoology.
- (g) Botany.
- (h) Anthropology.
- (i) Social and Economic Science.
- (j) Physiology and Experimental Medicine.

The various sections hold sessions in conjunction with the meetings of the association.

The printing of the proceedings of the association is an important part of the work. By arrangement with the weekly magazine "Science" all members are furnished with this magazine free. The magazine is the official organ of the association.

A library is maintained at the headquarters of the permanent secretary and the books and pamphlets contained therein are delivered to the members at their expense, the same to be returned at each meeting.

National Electric Light Association.

12. a. Object:—

To foster and protect the interests of those engaged in com-

mercial production of electricity for conversion into light, heat and power.

12. b. Means of attaining same:—

An annual convention at which papers and reports are presented.

Standing and special committees for standardizing methods of plant operation and management and for investigating new and promising improvements in station equipment. Among such subjects on investigation may be mentioned:

OFFICE METHODS AND ACCOUNTING.

INVESTIGATION OF THE STEAM TURBINE.

DISTRICT HEATING.

The question box has been developed further by this association than by any other. Printed lists of questions are distributed by mail early in the year to all interested parties, even outside the association. The results of this canvass last year produced a volume of nearly 500 pages.

c. Members. d. Privileges of same.

American Street Railway Association.

1. c. Members:—

AMERICAN STREET RAILWAY COMPANIES, LESSEES OR INDIVIDUAL OWNERS OF STREET RAILWAYS. Each applicant shall apply in writing to the secretary, enclosing the requisite fee and shall sign the constitution and by-laws.

1. d. Privileges of same:—

One vote each by delegate presenting proper credentials but no member in arrears for dues shall be entitled to vote. Any member may retire by giving written notice to that effect to the secretary and by the payment of all annual dues to that date, but shall remain a member and liable to the payment of dues until such payments are made, except as otherwise provided. A member may be expelled from the association by ballot of two-thirds of the members voting at any regular meeting upon written recommendation of the Executive Committee.

American Railway Mechanical and Electrical Association.

2. c. Members:—

1. ACTIVE. Heads of mechanical, electrical and way departments of railway companies.

2. ASSOCIATE. American Railway companies, lessees or individual owners.

3. JUNIOR. Employees of mechanical, electrical and way departments upon recommendation of at least one member.

4. HONORARY. Technical periodicals are eligible to this class upon recommendation of the Executive Committee.

2. d. Privileges of same:—

1. All privileges including one vote each.
2. One vote by delegate properly accredited.
3. All privileges except voting.
4. All privileges except voting.

American Association of Street Railway Claim Agents.

3. c d. Members. Privileges of same:—

So far but one class of membership has been provided for and all have similar privileges. Each member receives copies of all circulars and other matter and all have equal voting and office-holding privileges.

Street Railway Accountants' Association.

4. c. Members:—

American Street Railway Companies, lessees or individual owners of street railways. Each applicant shall apply in writing to the secretary, enclosing the requisite fee and shall sign the constitution and by-laws.

4. d. Privileges of same:—

One vote each by delegate presenting proper credentials but no member in arrears for dues shall be entitled to vote. Any member may retire by giving written notice to that effect to the secretary and by payment of all annual dues to that date, but shall remain a member and liable to the payment of dues until such payments are made, except as otherwise provided. A member may be expelled from the association by ballot of two-thirds of the members voting at any regular meeting upon written recommendation of the executive committee.

New York State Street Railway Association.

5. c. Members:—

Members of the association consist of street railway companies or lessees or individual owners of street railways in the State of New York.

5. d. Privileges of same:—

Each member is entitled to one vote by a delegation presenting proper credentials, but no member whose annual payment is in arrears shall be entitled to vote. Any member may retire by giving written notice to the secretary and paying all annual

dues to date but shall otherwise remain a member unless expelled, which may be done at any regular meeting of the association upon written recommendation of the executive committee, by ballot of two-thirds of the members voting.

American Railway Association.

6. c. Members:—

The membership consists of common carriers who operate American steam railways. A company, or two or more companies associated in interest and under one general operating official, is eligible to one membership only unless aggregate mileage of each company or companies exceeds one thousand miles, when they are eligible to one additional membership for each additional thousand miles.

Associate membership shall consist of these companies which operate less than 50 miles of road.

A member will not be entitled to vote if in arrears for dues.

6. d. Privileges of same:—

Each member has the privilege of voting for one candidate named for president and one for first and one for second vice-president and for any two candidates for membership on the executive committee and for any three candidates for membership on the committee on Train Rules, Car Service and Safety Appliances, and for any two or three candidates for the Committee on Nominations. A member may cast a ballot for any person for office and for any member of the association for membership for any committee.

American Railway Engineering and Maintenance of Way  
Association.

7. c. Members:—

ACTIVE MEMBERS comprise civil, mechanical and electrical engineers who have had five years' experience in the location, construction or maintenance of railroads; professors of engineering in colleges of recognized standing; railroad officials responsible for Maintenance of Way. No applicant, however, shall be less than twenty-five years of age.

HONORARY MEMBERS comprise persons of acknowledged eminence in railway engineering or management.

The number of honorary members is limited to ten.

7. d. Privileges of same:—

The active members shall have all privileges of the Association.

Honorary members shall have all privileges except those of voting and holding office.

Persons who are exclusively engaged in the sale and promotion of railroad patents or appliances shall not be eligible for active membership.

Master Car Builders' Association.

8. c. Members:—

ACTIVE MEMBERS comprise persons holding positions of superintendent of car department, master car builder, mechanical engineer, foreman of railroad car shop, joint car inspector or one representative from each car manufacturing company or other company owning over one thousand cars not in process of purchase by other parties.

REPRESENTATIVE MEMBERS comprise those having a practical knowledge of car construction and receiving a written appointment from a railroad official to represent its interests in the association, provided that no such member shall represent more than one railroad or system of roads under one management. Similarly a person may become a representative member from a private car company.

ASSOCIATE MEMBERS comprise civil engineers or other persons having such knowledge of construction of cars as would be valuable to the association. The number of associate members shall not exceed twenty.

LIFE MEMBERS are those who have been in good standing for twenty-five years in either the active or representative grade. Five dissenting votes shall reject a member from life membership.

8. d. Privileges of same:—

Active members shall have all the privileges of the association. Representative members shall have the privileges of active membership and in addition thereto shall on all measures pertaining to the adoption of standards or the expenditure of money have one more vote for each full one thousand cars which are owned or which are in use or in process of purchase by the road, system or private car company which he represents.

Master Mechanics' Association.

9. c. Members:—

ACTIVE MEMBERS comprise the following:

(1) Those above the rank of general foreman having charge of the designing, construction or repair of rolling stock.

(2) General foremen if their names are presented by their superior officers.

(3) Two representatives from each locomotive or car building works.

(4) One representative member from any railroad to represent its interests in the association.

ASSOCIATE MEMBERS comprise civil and mechanical engineers or other persons having knowledge of science or practical experience in matters relating to rolling stock such as would be of value to the association or railroad companies.

Members of the association who have been in good standing not less than five years and who through age or other causes ceased to be actively engaged in the mechanical department of railroad service may, upon unanimous vote of the members present at the annual meeting, be elected honorary members.

9. d. Privileges of same:—

Active members shall have all the privileges of the Association.

Representative members in addition to the above shall on all measures pertaining to the determination of what tests shall be conducted by the association or the expenditures of money for conducting the same, have one additional vote for each full one hundred engines in actual preparation or in process of purchase by the road or system which he represents.

Associate members shall have all the privileges of members except that of voting. Their number shall not exceed twenty.

International Tramway and Light Railways Association.

10. c. Members:—

Membership consists of three classes: First Class, Railway Companies. Second Class, Engineering or Manufacturing Firms or Companies interested in the Tramway industry. Third Class, Individual Members.

10. d. Privileges of same:—

Members have all the privileges in the various classes which are customary with this kind of association.

American Association for the Advancement of Science.

11. c. Members:—

Membership consists of five classes as follows: Members, Fellows, Patrons, Corresponding Members and Honorary Fellows.

MEMBERS may consist of any persons who have been recommended by two members or two fellows and elected by the Council.

Members may be either individuals, societies, libraries or other institutions in which case they may be represented by Presidents, Curators, Directors or Librarians, presenting proper credentials.

ASSOCIATES may be elected for a single meeting by the payment of a nominal fee. Associates may comprise either native or foreign members.

FELLOWS are persons elected by the Council on the basis of their professional engagements in science or by their having aided in advancing science.

PATRONS are those who have paid to the association the sum of \$1,000.

HONORARY MEMBERS may be elected to a number not exceeding three for each section and these shall have all the honors and privileges of the Fellows, but shall be exempt from fees and assessments.

CORRESPONDING MEMBERS consist of such scientists not residing in America as may be elected by the Council, not exceeding fifty in number.

11. d. Privileges of same:—

Members have all the privileges of the association, and associates have, for a single meeting, such privileges, excepting those of reading papers and voting. Members or associate societies, by conventions held at the same time and place as that of the American Association and which are recognized by the vote of the Council as affiliated societies, may become associate members for one meeting. They shall have all the privileges of membership except voting or appointment to office, but their names shall not appear in the report in the list of members present.

Foreign associates are entitled to all privileges except voting on matters of business. All other classes of membership are entitled to full privileges.

National Electric Light Association.

12. c. Members:—

Membership is divided into five classes as follows:

(Class a) MEMBER COMPANIES who are private corporations or individuals engaged in the business of producing and supplying electricity for light, heat and power for commercial and public use.

(Class b) MEMBERS who shall be officers or employes of member companies elected and continued only from year to year with the written consent of the members with whom connected.

(Class c) MEMBERS who comprise instructors and teachers of engineering and related sciences.

(Class d) ASSOCIATE MEMBER COMPANIES comprising electricians, electrical or mechanical engineers, manufacturers (corporations or individuals) who are directly or indirectly interested in advancing the use of electricity.

(Class e) ASSOCIATE MEMBERS comprising officers or employes of member companies elected and continued from year to year with the written consent of the associate member company with whom connected.

HONORARY MEMBERS shall include those already elected as such and such other persons as may be elected upon the unanimous recommendation of the executive committee and approved by a two-thirds vote of the association.

12. d. Privileges of same:—

Class (a) are entitled to vote and those only. Class (b) have all the privileges of Class (a) except the right to vote and to attend the executive sessions of the convention. They shall be allowed to attend such executive sessions upon obtaining written consent of a Class (a) member vouching for their membership.

Class (c) have all the privileges of Class (a) except the right to vote, to hold office and to attend executive sessions of the convention. Class (d) have the right to attend all meetings except executive sessions and to discuss papers read before the association. Class (e) have the same privilege as Class (d).

e. Officers.

American Street Railway Association.

1. e. Officers—

PRESIDENT, who presides at all meetings of the association and of the Executive Committee.

THREE VICE-PRESIDENTS, who preside in their order in case of the absence of the President.

TREASURER, who receives and safely keeps all moneys of the association; keeps correct accounts of the same; pays all bills approved by the president; and reports annually to the association. He gives bond to the president in such sum and with such sureties as are approved by the Executive Committee.

SECRETARY, who takes minutes of all proceedings of the association and of the Executive Committee and enters the same in proper books. He conducts the correspondence of the association, reads minutes and notices of meetings, also papers and communications if the authors wish it.

THE EXECUTIVE COMMITTEE comprises the president, vice-president and five others all of whom shall be elected by ballot at each meeting of the association.

American Railway Mechanical and Electrical Association.

2. e. Officers:—

The officers and their duties are exactly the same as those of the American Street Railway Association, except that the executive committee consists of the president, three vice-presidents, the secretary and treasurer (who may be one and the same person) and four others.

American Association of Street Railway Claim Agents.

3. e. Officers:—

The association has been in operation but a few months and a regular constitution has not yet been adopted. The duties of the officers, however, are those usually appertaining to their several positions. The officers are as follows:

PRESIDENT, one VICE-PRESIDENT and a SECRETARY-TREASURER.

THE EXECUTIVE COMMITTEE at present consists of the three officers mentioned and three other members, the president being an ex-officio member of the committee.

Street Railway Accountants' Association.

4. e. Officers:—

PRESIDENT, who presides at all meetings of the association and of the executive committee.

THREE VICE-PRESIDENTS, who preside in their order in case of the absence of the president.

TREASURER, who receives and safely keeps all moneys of the association; keeps correct accounts of the same; pays all bills approved by the president; and reports annually to the association.

SECRETARY, who takes minutes of proceedings of the association and of the executive committee and enters them in proper books. He conducts the correspondence of the association, reads minutes and notices of meetings, also papers and communications if the authors wish it.

(The offices of treasurer and secretary are held by the same person.)

THE EXECUTIVE COMMITTEE comprises the president,

the three vice-presidents, the secretary-treasurer, and four others. They have the entire charge and management of the affairs of the association. They are elected by ballot at each regular meeting of the association. The executive committee meets one hour before the opening of each annual meeting of the association and on other occasions when the president deems it necessary. A vote may be taken by mail if necessary.

New York State Street Railway Association.

5. e. Officers:—

PRESIDENT, who presides at all meetings of the association.

TWO VICE-PRESIDENTS, who preside in their order in case of the absence of the President.

TREASURER, who receives and keeps all moneys of the association; keeps correct accounts of the same; pays all bills approved by the executive committee; and makes an annual report to the association. He gives a bond to the president in such sum and with such sureties as are approved by the executive committee.

SECRETARY, who takes minutes of the association and of the executive committee, and enters the same in proper books. He conducts the correspondence of the association; reads minutes, also papers and communications if the authors wish it. He is paid a salary which is fixed by the executive committee.

THE EXECUTIVE COMMITTEE comprises the president, two vice-presidents, the secretary, the treasurer and four others all of whom are elected at each regular meeting of the association and these have entire charge and management of the affairs of the association.

American Railway Association.

6. e. Officers:—

PRESIDENT, who presides at all meetings of the association.

TWO VICE-PRESIDENTS, who preside in their order in case of the absence of the president.

TREASURER, who receives, dispenses, and accounts for all money received or expended.

SECRETARY, who is the same officer as the treasurer, and who keeps a full and complete record of all proceedings of the regular and special sessions; notifies the members of date and election of same and provides printed copies of the proceedings of each session; and is secretary of all committees and performs such other duties as the association or the by-laws shall prescribe.

The term of office is one year.

THE EXECUTIVE COMMITTEE comprises nine members including the president and vice-presidents.

It is their duty to decide upon applications for membership; select a secretary and treasurer, and announce his name at the April session, fix his compensation and audit his accounts and expenditure of money; act as advisory committee to the president; call over the names of nine persons at the April session and of six persons at the October session as candidates for the committee on nominations. The executive committee is required to make a report at each regular session including a detailed financial statement, the action it has taken and any recommendation it may have to suggest on matters of importance to the association that are not being otherwise considered.

Ex-presidents of the association are ex-officio members of the association as long as they are eligible to serve on committees.

The following standing committees are authorized and required by the by-laws and are therefore on the same footing as the executive committee:

COMMITTEE ON TRAIN RULES, nine members, which examines into and reports upon questions affecting the "Standard Code of Train Rules."

COMMITTEE ON TRAIN SERVICE, nine members, the duty of which is to examine into and report upon questions affecting the movement of, the distribution of and the accounting for cars.

COMMITTEE ON SAFETY APPLIANCES, nine members, the duty of which is to consider and report upon accounts affecting the essential requisites for safety appliances.

COMMITTEE ON NOMINATIONS, five members, the duty of which is to make a specified number of nominations for each office of the association.

American Railway Engineering and Maintenance of Way  
Association,

7. e. Officers:—

PRESIDENT, who shall preside at all meetings of the association and who shall not be eligible to such election until eight years shall have elapsed after the expiration of his previous term of office.

TWO VICE-PRESIDENTS, who shall preside in their order at all meetings in the absence of the president.

The term of office of both the president and the vice-presidents is two years.

A TREASURER, who shall receive and deposit all moneys in the name of the association and shall receipt to the Secretary therefor. He shall invest all funds not needed for current disbursement that shall be ordered by the Board of Direction.

He shall pay all bills when properly certified and audited by the Finance Committee and make such reports as may be called for by the Board of Direction. The term of office of the treasurer is one year.

A SECRETARY, who shall be, under the direction of the president and Board of Direction, the executive officer of the association. He shall attend all meetings of the association and of the Board of Direction, prepare the business therefor and duly record the proceedings thereof. He shall see that all the moneys due the association are carefully collected and without loss transferred to the custody of the treasurer who shall personally certify to the accuracy of all bills or vouchers on which money is to be paid. He is to conduct the correspondence of the association and keep proper records thereof and perform such other duties as may be assigned to him from time to time by the Board of Direction. The term of office of the secretary is one year.

THE BOARD OF DIRECTION, which consists of the president, the two vice-presidents, six directors, the secretary and the treasurer and the four latest living Past-Presidents who are active members. This board shall act as Trustees and have the custody of all property belonging to the association and in them the government of the association shall be vested.

The term of office of the directors shall be three years.

The following standing committees are provided for by the Constitution:

A FINANCE COMMITTEE of three members which has immediate supervision of the accounts and financial affairs of the association. They approve bills before payment and make recommendation to the Board of Direction as to the investment of money and as to other financial matters. They have not the power to incur debts or other obligations binding the association nor authorize the payment of money other than amounts necessary to meet ordinary current expenses of the association, except by previous action and authority of the Board of Direction.

A LIBRARY COMMITTEE, which has general supervision of the library of the association and property therein.

A COMMITTEE ON PUBLICATIONS which has general supervision of the publications of the association.

The Board of Direction has the power to appoint such other standing committees as it deems best to investigate, consider and report on methods or appliances pertaining to the general question of railroad location, construction or maintenance.

Master Car Builders' Association.

8. e. Officers:—

A PRESIDENT who shall perform the usual duties attached to such office. He holds office for one year or until his successor is chosen.

THREE VICE-PRESIDENTS who hold office for one year and who preside in their order in the absence of the president.

A TREASURER who gives bond to an amount which a majority of the members of the Executive Committee demand. No bills are paid by him for the association except for current expenses, unless they have been certified by the person or persons authorized to contract them and audited by the executive committee. The treasurer holds office for one year.

A SECRETARY who may or may not be a member of the association and whose appointment is by a majority of the Executive Committee at its first meeting after the annual election. He is appointed for one year. Two-thirds of the members of the Executive Committee shall have power to remove the secretary at any time. His compensation, if any, is fixed for the time that he holds office by the majority of the Executive Committee. He acts as secretary of the Executive Committee.

THE EXECUTIVE COMMITTEE, which consists of the president, the three vice-presidents, the treasurer, the secretary and six executive members. Executive members hold office for two years and three are elected each year.

The following additional committees are also provided by the constitution:

A NOMINATING COMMITTEE consisting of five members who are not officers.

AN AUDITING COMMITTEE consisting of three members not officers, to examine accounts and vouchers of the treasurer.

A COMMITTEE ON SUBJECTS FOR INVESTIGATION AND DISCUSSION which is appointed annually.

COMMITTEES ON INVESTIGATIONS which are specially appointed to consider subjects suggested by the preceding committee.

## Master Mechanics' Association.

## 9. e. Officers:—

A PRESIDENT who shall perform the usual duties of such office, including the appointment of all committees, designating their chairmen, except otherwise provided by the constitution, and approving all bills against the association for payment by the treasurer.

THREE VICE-PRESIDENTS whose duty it shall be according to rank to perform the duties of the president in his absence.

A SECRETARY who keeps a full and correct account of all transactions. He keeps a record of the names and places of residence of all members and the name of the railroad which each represents; he certifies as to the persons eligible as candidates for the association scholarships; he receives and keeps an account of all money paid to the association and delivers the same to the treasurer taking his receipt therefor; he receives from the treasurer all paid accounts, giving him a receipted statement of the same.

A TREASURER who receives from the secretary all money belonging to the association; he receives all bills and pays the same after approval by the president; he delivers all paid bills to the secretary at the close of each meeting taking the receipted statement of the same; and he keeps an exact account of all transactions pertaining to his office.

The EXECUTIVE COMMITTEE comprises all of the officers with the exception of the secretary. Their duty is to exercise a general supervision over the affairs of the association; to recommend the amount of the annual assessment; to call, to prepare for and to conduct the general conventions and to make all necessary expenditures and contracts required to conduct the business of the association; but they shall have no power to make the association liable for an amount beyond that which at the time of the contract, shall be in the hands of the treasurer in cash, and not subject to prior liabilities.

The executive committee also receives and approves before publication, reading all communications, papers and reports on all mechanical and scientific matters; they decide what portion of the same shall be submitted to each convention and what shall be printed in the annual report.

The constitution also provides for the following committees:

An AUDITING COMMITTEE to examine the accounts of the treasurer.

## A COMMITTEE ON SUBJECTS FOR INVESTIGATION AND DISCUSSION.

## A COMMITTEE ON INVESTIGATION.

International Tramways and Light Railway Association.

## 10. e. Officers:—

A BOARD OF DIRECTORS, consisting of a PRESIDENT, two VICE-PRESIDENTS, six members and the GENERAL SECRETARY.

The duties of these officers are as usual.

American Association for the Advancement of Science.

## 11. e. Officers:—

The officers of the association consist of the following: a President, a Vice-President from each section, a permanent secretary, a general secretary, a secretary of the council, a treasurer and a secretary of each section.

These, with the exception of the permanent secretary and treasurer and the secretaries of the sections, shall be elected at each meeting for the following one and with the exception of the treasurer and the permanent secretary shall not be eligible for re-election for the next two meetings. The term of office for the permanent secretary, the treasurer, and the secretaries of the sections shall be five years.

The PRESIDENT shall preside at all general sessions and at all meetings of the Council. It is the duty of the President to give an address at the general session of the association at the meeting following that over which he presided.

The VICE-PRESIDENTS shall be chairmen of their respective sections, and of their Sectional Committees, and it shall be part of their duty to give an address, each before his section, at such time as the Council shall determine at the meeting subsequent to that at which he presides.

The GENERAL SECRETARY shall be the secretary of all General Sessions of the Association, and he shall keep a record of all the business of the sections. He shall receive the records from the Secretaries of the Sections, which, after examination, he shall transmit with his own records to the permanent secretary within two weeks after the adjournment of the meeting.

The SECRETARY OF THE COUNCIL shall keep the records of the Council. He shall give the Secretary of each section the

titles of papers assigned to it by the Council. He shall receive proposals for membership and bring them before the Council.

The PERMANENT SECRETARY shall be the executive officer of the association under the direction of the Council. He shall attend to all business not specially referred to the committees nor otherwise constitutionally provided for. He shall keep an account of all business that he has transacted for the Association, and make annually a general report for publication in the annual volume of Proceedings. He shall attend to the printing and distribution of the annual volume of Proceedings, and all other printing ordered by the Association. He shall issue a circular of information to members and fellows at least three months before each meeting, and shall, in connection with the Local Committee, make all necessary arrangements for the meetings of the Association. He shall provide the secretaries of the Association with such books and stationery as may be required for their business, and shall provide members and fellows with such blank forms as may be required for facilitating the business of the Association. He shall collect all assessments and admission fees, and notify fellows and members of their election, and of any arrearages. He shall receive, and bring before the Council, the titles and abstracts of papers proposed to be read before the Association. He shall keep an account of all receipts and expenditures of the Association and shall report the same annually at the first meeting of the Council, and shall pay over to the treasurer such unexpended funds as the Council may direct. He shall receive and hold in trust for the Association all books, pamphlets, and manuscripts belonging to the Association, and shall allow the use of the same under the provisions of the Constitution and the orders of the Council. He shall receive all communications addressed to the Association during the intervals between meetings, and properly attend to the same. He shall at each meeting report the names of fellows and members who have died since the preceding meeting. He shall be allowed a salary which shall be determined by the Council, and may employ one or more clerks at such compensation as may be agreed upon by the Council.

The TREASURER shall invest the funds received by him in such securities as may be directed by the Council. He shall annually present to the Council an account of all the funds in his charge. No expenditure of the principal in the hands of the Treasurer shall be made without a unanimous vote of the Council, and no expenditure of the income received by the Treasurer

shall be made without a two-thirds vote of the Council. The Treasurer shall give bonds for the faithful performance of his duty in such a manner and sum as the Council shall from time to time direct.

The SECRETARIES OF THE SECTIONS shall keep the records of their respective Sections, and, at the close of the meeting, give the same, including the records of sub-sections, to the General Secretary. They shall also be the Secretaries of the sectional committees. The Secretaries shall have seniority in order of their continuous membership of the Association.

In case of vacancy in the office of President, the Senior Vice-President shall preside, as provided for, until the General Committee can be assembled and the vacancy filled by election. Vacancies in the offices of Vice-President, Permanent Secretary, Secretary of the Council, Secretaries of the Sections, and Treasurer, shall be filled by the Council by ballot.

The COUNCIL shall consist of the Past Presidents, and the Vice-President of the last two meetings, together with the President, the Vice-Presidents, the Permanent Secretary, the General Secretary, the Secretary of the Council, the Secretaries of the Sections, and the Treasurer of the current meeting, of one fellow elected from each Section by ballot on the first day of its meeting, of one fellow elected by each affiliated society, and one additional fellow from each affiliated society having more than twenty-five members who are fellows of the association, and of nine fellows elected by the Council, three being annually elected for a term of three years. The members present at any regularly called meeting of the Council, provided there are at least five, shall form a quorum for the transaction of business. The Council shall meet on the day preceding each annual meeting of the Association, and arrange the program for the day of the sessions. The time and place for this first meeting shall be designated by the Permanent Secretary. Unless otherwise agreed upon, regular meetings of the Council shall be held in the Council room at 9 o'clock, a. m., on each day of the meeting of the Association. Special meetings of the council shall be called at any time by the President. The Council shall be the board of supervision of the Association, and no business shall be transacted by the Association that has not been referred to, or originated with, the Council. The Council shall decide what papers and other proceedings shall be published, and have the general direction of the publications of the Association; manage the finan-

cial affairs of the Association; arrange the business and programs for general Sessions; suggest subjects for discussion, investigation or reports; elect members and fellows; and receive and act upon all invitations extended to the Association and report the same at the General Session of the Association. The Council shall receive all reports of Special Committees and decide upon them, and only such shall be read in General Session as the Council shall direct. The Council shall appoint at each meeting the following sub-committees which shall act, subject to appeal to the whole Council, until their successors are appointed at the following meeting: 1, on Papers and Reports; 2, on Members; 3, on Fellows.

The GENERAL COMMITTEE shall consist of the Council and one member or fellow elected by each of the Sections, who shall serve until their successors are elected. It shall be the duty of the Committee to meet at the call of the President and elect the general officers for the following meeting of the association. It shall be the duty of the committee to fix the time and place for the next meeting. The Vice-President and Secretary of each Section shall be recommended to the General Committee by the Sectional Committees.

National Electric Light Association.

12. e. Officers:—

A PRESIDENT who is elected to serve for one year and who must be a member of Class (a) or (b). He is chairman of the executive committee and is not eligible for re-election for two years after his term has expired.

TWO VICE-PRESIDENTS who shall perform the duties of the president in his absence.

A SECRETARY who shall not serve as a member of any committee. He shall be eligible for re-appointment without limit and he shall perform such duties as the executive committee shall determine. He shall be nominated by the president and confirmed by the executive committee. He may be a member of any class other than (c) or an honorary member.

A TREASURER who may be the same person as the secretary and who shall give a security bond in such an amount and with such qualification as the executive committee may determine.

AN EXECUTIVE COMMITTEE consisting of nine members which shall be the governing board of the association; shall manage its affairs and pass upon all applications for membership;

the eligibility of representatives. Five members shall constitute a quorum.

**f. Meetings.**

American Street Railway Association.

1. f. Meetings:—

Regular meetings of the association shall be held at such time between September 15th and December 15th and at such place as the Executive Committee may decide and each member is to be notified of the place and date by March 1st of the same year. Special meetings may be held upon the order of the Executive Committee. Each member shall be notified by the secretary of every meeting thirty days in advance. Fifteen members shall constitute a quorum at any meeting. At these meetings a prescribed order of business is followed. Any member may admit a friend at each meeting but such person shall not take part in the discussion except by permission of the meeting.

All papers read at the meetings must relate to matters connected with the object of the association. The subjects of these papers must have either been approved by the Executive Committee or thirty days' notice of their proposed presentation shall have been given to the secretary.

American Railway Mechanical and Electrical Association.

2. f. Meetings:—

The regular meetings shall convene at the same place as those of the American Street Railway Association and two days in advance of the same. Three sessions are held on each of the first two days.

The secretary notifies all members at least thirty days in advance of all meetings.

Ten members constitute a quorum at any meeting.

American Association of Street Railway Claim Agents.

3. f. Meetings:—

But one meeting has thus far been held, namely, that for organization. It was the general wish of those present at the first meeting to have these held separate from those of the American Street Railway Association. The time and place of the next meeting are to be settled in a short time by letter ballot.

## Street Railway Accountants' Association.

## 4. f. Meetings:—

REGULAR MEETINGS are held at the same time and place as that of the American Street Railway Association.

SPECIAL MEETINGS are held upon order of executive committee and notices of these must be sent by the secretary in a circular to each member at least thirty days before the time of meetings. Ten members constitute a quorum at any meeting.

## New York State Street Railway Association.

## 5. f. Meetings:—

The regular meetings of the association are held on the second Tuesday in September of each year and at an hour and place designated at the preceding meeting. Special meetings are held upon the order of the executive committee and due notice of every meeting must be given by the secretary to each member. Ten members constitute a quorum at any meeting.

## American Railway Association.

## 6. f. Meetings:—

Regular sessions of the association are held on the 4th Wednesdays of April and October of each year at such places as the association may determine. Special sessions are called by the president at the request of the executive committee or on written request of ten members. The executive committee may change the date of a regular session when in its judgment the best interests of the association will be thereby conserved.

## American Railway Engineering and Maintenance of Way Association.

## 7. f. Meetings:—

The regular annual meeting of the association is held in Chicago, commencing on the third Tuesday of March of each year. Twenty-five active members constitute a quorum. Other meetings may be held at such times and places as the Board of Direction may select. The members are notified by the secretary of all meetings at least thirty days in advance thereof.

The Board of Direction meets at such time and such place as the president directs. Five members constitute a quorum.

## Master Car Builders' Association.

## 8. f. Meetings:—

The regular annual meeting is held in June of each year. The date of the commencement of the meeting is fixed by a com-

mittee acting jointly with a committee of the American Railway Master Mechanics' Association. The place of the meeting is fixed at least six months before the date by a committee acting jointly with one from the allied association. At these meetings the regular hours of sessions are from 10 a. m. to 1:30 p. m., on the first day and from 9 a.m. to 1:30 p. m. on other days. Fifteen or more members constitute a quorum.

Master Mechanics' Association.

9. f. Meetings:—

The regular meeting of the association is held annually in June. The executive committee forms a part of a joint committee with the Master Car Builders' to decide on the places of meeting. This joint committee meets within six months of the annual convention. Fifteen members constitute a quorum.

International Tramways and Light Railways Association.

10. f. Meetings:—

Meetings are held every two years at various cities in Europe and these meetings are very elaborate. They cover four days each. The local committee takes care of the convention and in connection with the same an elaborate exhibit of railway apparatus is held.

American Association for the Advancement of Science.

11. f. Meetings:—

The annual meeting which continues for one week or longer is held at a place and time determined by vote of the General Committee and the preliminary arrangements for the meetings are made by the local committee in conjunction with the permanent secretary.

A general session is held at 10 a. m. on the first day of the meeting and at such other time as the Council may direct.

Sectional meetings are held during the entire time of the conventions.

National Electric Light Association.

12. f. Meetings:—

The annual meeting shall be held in May or June of each year, alternately in the cities of New York and Chicago unless otherwise directed by the executive committee and on such days as the executive committee shall determine. Fifteen Class (a) members constitute a quorum.

The permanent office of the association is maintained in the City of New York, located, furnished and governed in such a manner as the executive committee determines.

**g. Lines of work undertaken.**

American Street Railway Association.

1. g. Lines of work undertaken:—

The association has during the twenty-three years of its existence covered an extensive field. The divisions of this field may be roughly stated at follows:

1. It has been the means of creating a fellow-feeling among its members and by bringing the workers together has stimulated progress and fostered a spirit of good fellowship. This has been and perhaps is, its most important function.

2. It has brought together the leaders in the different departments of railway work and has emphasized the independence of all branches of the service.

3. It has through reports, papers and discussions tended to improve and standardize electric railway practice. The combined wisdom of the profession has thus been at the command of all.

The above results have been accomplished largely through conventions although the work of a number of special committees has been done outside of the conventions. However, no attempt has been made to systematically cover the electric railway field as it has become so diversified in its interests and so technical in its requirements that to do so under the present organization is out of the question. The necessity for a thorough and regular treatment of technical matters is shown by the recent rise of several special organizations for the specific purpose of exhaustively covering the several special fields.

American Railway Mechanical and Electrical Association.

2. g. Lines of work undertaken:—

While this association is young, having but recently issued its second annual report, it is already endeavoring to standardize matters relating to its rolling stock, maintenance of way and power generation and distribution. A recent move in this direction has been the appointing of a systematically chosen list of standing committees covering the whole field of mechanical, electrical and civil engineering of electric railways. Similarly the topics chosen for papers are divided among the various departments represented in the association.

## American Association of Street Railway Claim Agents.

## 3. g. Lines of work undertaken:—

Owing to the fact that the association has been in operation but a few months little systematic work has as yet been undertaken. It is the general purpose of this work to assist the members in detecting fraudulent claims and in warning each other about the same. Also in assisting each other in regard to out-of-town witnesses, collecting testimony and performing other service calculated to protect the companies from fraudulent or excessive claims. One plan which is already in operation is the sending out of warning circulars from the secretary's office to the members, putting them upon their guard against traveling thieves.

## Street Railway Accountants' Association.

## 4. g. Lines of work undertaken:—

As is indicated by the title of the association its main functions are:

- (a) To maintain a complete system of electric railway accounting.
- (b) To revise this so as to adapt it to the constantly changing conditions of modern practice.
- (c) To secure the wide use of the system and to instruct the members how to use it efficiently.

The objects are accomplished through the reading and discussion of papers; through correspondence and through the maintenance of a collection of blank forms used in electric railway accounting.

## The Standard System of Electric Railway Accounting and

The Standard Form of Report for Electric Railways are in general use and have greatly simplified the methods of accounting throughout the country.

## New York State Street Railway Association.

## 5. g. Lines of work undertaken:—

This association has been very active in standardizing current practice in electric railway operation in the State of New York. A great feature is made of papers prepared by the members and others on the practical as well as the scientific features of electric railway work. Less work is done by standing committees and special committees although these have contributed considerably to the success of the association. The report of the committee on Rules for the Government of Conductors and

Motormen has been very generally adopted and is a model of its class.

Recently an excellent question box has been introduced and the topics covered in this are systematically arranged. The topics include all features connected with the subject and the responses to the questions have been very general.

American Railway Association.

6. g. Lines of work undertaken:—

The association is largely concerned with the work of its standing committees. Its chief function is to recommend rules for the proper operation of steam railways and it does not concern itself with technical matters relating to construction, which matters are carefully considered by other associations.

American Railway Engineering and Maintenance of Way  
Association.

7. g. Lines of work undertaken:—

This association very systematically covers the whole field in which it operates by means of standing committees of which a list has already been given.

A manual of recommended practice which contains definitions, specifications and principles of practice adopted and recommended by the association is edited under the direction of the Committee on Publications, and the publishing is approved by the Board of Direction. The matter in the manual is not binding on the members but includes recommendations which are generally adopted by the members in order to unify and systematize their practice. This manual is revised annually.

The committees are chosen for their peculiar fitness for the work assigned to them and through these committees which are very active, the association is maintained at a high degree of efficiency.

The activity of this association is to be largely credited to the fact that a permanent secretary and assistant secretary are provided and the publications are all systematized by the editor.

A noticeable feature of this association is the number of college professors of railroad engineering who take part in this work.

Master Car Builders' Association.

8. g. Lines of work undertaken:—

This association concerns itself with details of construction of cars and of other matters growing out of car construction.

Other important work is to recommend standards of construction, loading, etc., for all kinds of cars. Their work is of exceptional importance due to the custom throughout the country of interchanging cars between roads. They have worked out in great detail such matters as construction of couplers, the loading of cars, dimensions of cars and many other such matters. Their annual proceedings cover a volume of about six hundred pages, replete with exact technical information in regard to car building. The maintenance of cars also receives considerable attention. The conventions are taken up largely with discussions of reports of standing and special committees which reports are exceedingly specific and complete.

Master Mechanics' Association.

9. g. Lines of work undertaken:—

As has been outlined under section (b), the work of this association is very similar to that of the Master Car Builders' except that it deals with another part of the field. The committee work is very thorough and the results of the work form the standard text books of the master mechanics' departments of the various roads, though recommendations are not binding in character but are such as to meet with general approval.

International Tramway and Light Railways Association.

10. g. Lines of work undertaken:—

The principal work of the association consists in the discussion at the conventions, and in the submitting and answering of questions dealing with important matters in railway operation. The manner in which the questions are answered is very thorough and the two volumes which comprise the answers to questions and the reports of discussions fill over 800 extra large pages.

American Association for the Advancement of Science.

11. g. Lines of work undertaken:—

The principal work of the association consists in the preparation, presentation and discussion of papers relating to science.

National Electric Light Association.

12. g. Lines of work undertaken:—

The principal work of the association consists in the papers and reports presented at conventions, this being the work of standing and special committees to a considerable extent. This association has developed the Question Box further than any other. A great deal of work is put into the matter of securing

questions and answers and circulating the same. The volume of questions and answers for the current year occupies nearly five hundred pages and is a complete compendium of the current practice in electric lighting work. It is elaborately indexed and is very convenient for reference. The questions are sent all over the country to any person who would be likely to answer them intelligently.

**h. dues.**

American Street Railway Association.

1. h. Dues:—  
Admission fee—\$25.00.  
Annual dues—\$25.00.  
payable in advance.

American Railway Mechanical and Electrical Association.

2. h. Dues:—  
ACTIVE MEMBERS, \$5.00 per annum,  
ASSOCIATE MEMBERS, \$20.00 per annum,  
JUNIOR MEMBERS, \$3.00 per annum,  
all payable in advance.

American Association of Street Railway Claim Agents.

3. h. Dues:—  
No settled policy has yet been decided upon but for the first year these have been placed at \$5.00.

Street Railway Accountants' Association.

4. h. Dues:—  
Members pay annual dues of \$20.00 each and it is the duty of members to make such returns to the secretary as are required by the executive committee.

New York State Street Railway Association.

5. h. Dues:—  
The association collects fees graduated upon the ability of its members to pay. The assessment levied is based upon reports of gross receipts filed with the state board of railway commissioners for the preceding fiscal year, ending June 30th. This assessment is paid in lieu of all annual dues and it is paid to the treasurer of the association on or before the first day of September of each year.

Admission fees are as follows:

Members whose gross annual receipts from passengers are more than \$100,000, \$25.00.

Members whose gross annual receipts from passengers are less than \$100,000, \$5.00.

An annual assessment is levied upon each member of the association upon the following basis:

Those whose gross annual receipts are less than \$50,000, \$10.00.

Those whose gross annual receipts are over \$50,000 and less than \$100,000, \$25.00.

Those whose gross annual receipts are over \$100,000, and less than \$300,000, \$150.00.

Those whose gross annual receipts are over \$300,000, and less than \$500,000, \$300.

Those whose gross annual receipts are over \$500,000, and less than \$1,000,000, \$400.00.

Those whose gross annual receipts are over \$1,000,000, \$600.00.

*American Railway Association.*

6. h. Dues:—

Each membership pays a fee of \$10.00 and such other sums as may be assessed by the executive committee. Associate members pay annual dues of \$20.00 but they are not subject to mileage assessments. All dues are payable April first. Assessments when made are based upon the number of miles of road operated, leased or controlled by each member.

*American Railway Engineering and Maintenance of Way Association.*

7. h. Dues:—

An initiation fee of \$10.00 is paid with each application for membership and the annual dues are \$10.00 payable during the first three months of each calendar year for the current year.

*Master Car Builders' Association.*

8. h. Dues:—

Each member is subject to the payment of annual dues which are assessed at each annual meeting but no assessment shall exceed eight dollars. Each representative member pays in addition to his dues the same amount for each additional vote to which

he is entitled and dues are payable when the amount is announced by the president at each annual meeting. The name of any member who is three years in arrears for dues may be stricken from the list of members at the discretion of the executive committee.

Master Mechanics' Association.

9. h. Dues:—

Dues are assessed at the annual convention at an amount not to exceed \$5.00. A representative member pays in addition to his personal dues an additional assessment for each additional vote to which he is entitled. Upon a unanimous vote of the members present at the annual meeting a member may be elected an honorary member.

International Tramways and Light Railways Association.

10. h. Dues:—

Dues are paid by all classes of members as follows:

Railways with annual gross receipts of less than 1,000,000 francs, 50 francs; 1,000,000 to 2,000,000 francs, 100 francs; 2,000,000 to 3,000,000 francs, 150 francs; 3,000,000 to 4,000,000 francs, 200 francs; 4,000,000 to 5,000,000 francs, 250 francs; above 5,000,000 francs, 300 francs.

American Association for the Advancement of Science.

11. h. Dues:—

Members are required to pay an admission fee of \$5.00 and annual dues of \$3.00. Associates pay \$3.00 for each meeting. Patrons pay \$1,000.00 each.

National Electric Light Association.

12. h. Dues:—

Class (a) entrance fee, \$25.00. Annual dues in cities of less than 20,000 population, \$10.00. In cities from 20,000 to 300,000 population, \$25.00. In cities over 300,000 population, \$50.00.

Class (b) initiation fee, \$5.00; annual dues, \$5.00.

Class (c) no initiation fee; annual dues, \$4.00.

Class (d) initiation fee, \$25.00; annual dues \$20.00.

Class (e) initiation fee, \$5.00; annual dues, \$5.00.

All dues are payable in advance and cover the calendar year. Any member in arrears for dues for one year shall be dropped from the rolls and if reinstated shall pay full dues for the time during which membership lapsed, or if required by the executive committee shall pay again the entrance fee of his class.

**Bankers' Associations.**

## American Bankers' Association.

## 13. a. Object:—

"To promote the general welfare and usefulness of banks and banking institutions, and to secure uniformity of action, together with the practical benefit to be derived from personal acquaintance and from the discussion of subjects of importance to the banking and commercial interests of the country, and especially in order to secure the proper consideration of questions regarding the commercial and financial usages, customs and laws which affect the banking interests of the entire country, and for the protection against loss by crime."

## 13. b. Means of attaining same:—

Annual conventions, standing committees, and correspondence through the secretary's office. The association has recently organized sections which are under the supervision of the Executive Council. These sections at present are the Savings Banks' Section and the Trust Companies' Section. They meet annually in connection with the association.

## New York State Bankers' Association.

## 14. a. Object:—

Identical with those of the American Bankers' Association.

## 14. b. Means of Attaining same:—

Similar to those of the National except that no standing committees are provided for.

## American Bankers' Association.

## 13. c. Members:—

Membership includes national or state banks, trust companies, savings banks, and banking firms, each of which may send one delegate to the annual meeting, said delegates being officers, directors or trustees of the institution represented or members of banking firms or individuals doing business as banks.

Any state association of banks or bankers may be represented at all conventions of this association by one delegate for every fifty members of such association and such delegates shall be entitled to all privileges of the convention. Any state association having less than fifty members shall be entitled to one delegate but other than this no fractional part of fifty members shall entitle an association to an additional delegate.

## 13. d. Privileges of same:—

All members of the association have similar privileges in accordance with the statements under the head "Object."

## New York State Bankers' Association.

## 14. c. Members:—

National or state banks or bankers, or officials of clearing houses in the State of New York. All members in good standing may send to the meetings a delegate or delegates who shall be entitled to vote.

## 14. d. Privileges of same:—

It is the duty of each member to notify the Chairman of the Council of any fraud or crime practiced on any banking firm that will be of general interest. General privileges are similar to those of membership in any association.

## American Bankers' Association.

## 13. e. Officers:—

The administration of the affairs of the association shall be vested in the President and Vice-President of this Association, and one Vice-President for each state and territory which may be represented in this Association, and in an Executive Council, who shall be elected at the annual meetings and who shall serve until their successors are chosen or appointed. The Executive Council shall be composed of thirty members, divided into three classes, one-third of whom shall be elected annually. Five members of the Executive Committee shall be annually chosen by the delegates from the several state associations of banks and bankers. The President and Vice-Presidents and ex-Presidents, if still members of the Association, shall also be members ex-officio; and no President or Vice-President not retiring member of the Executive Council shall be eligible for re-election for the period of one year after the expiration of his term of office.

Immediately after the first adjournment that occurs in the session of the annual convention, the delegations from each state and territory shall meet, at which several meetings the respective Vice-Presidents of the states and territories, if present, shall preside, and these meetings of representatives from the states and territories shall each select a member, who shall, with others so selected, constitute and be a Committee on Nominations. The Committee may make its report at any subsequent session of the Convention, but its nominations shall not exclude the name of

any person otherwise nominated in the Convention. The delegates from the several state banks and Bankers' Associations shall assemble and meet apart after the first adjournment, and, in such manner as they may determine, shall nominate to the convention five names for members of the Executive Council, who shall be members of the Association, provided that no state association shall be thus represented by more than one member of the Executive Council. No delegate from any state Association shall, however, be eligible unless he is a member of the American Bankers' Association. The elections for President, First Vice-President and for five members of the Executive Council to be chosen by the Association shall be by ballot, unless otherwise ordered.

Each Vice-President other than the First Vice-President, shall have the supervision of such business of the Association, exclusive of the general business in charge of the Executive Council and other officers, as may pertain to the state and territory in which he resides, and may call meetings therein relative to such business whenever he may deem it necessary.

The Executive Council shall meet immediately upon the adjournment of the annual convention of the Association, and, a quorum being present, elect one of their number chairman and appoint standing committees, a Secretary and Treasurer, and such other employes of the Association as may be deemed proper, and the Council may at their discretion, discharge the Secretary, Treasurer or other employes. The Executive Council shall have power to fill vacancies that may occur in any of the offices of the Association and in the membership of the Council.

The Executive Council shall take charge of the general business of the Association, receive communications, arrange for holding the annual convention and other meetings, procure and arrange subjects for discussion in the order in which they may come before the convention, provide for speakers and carry out the resolutions passed. They may appoint a standing advisory committee of seven, including the President of the Association and the Chairman of the Council. The attendance of seven members of the Council shall constitute a quorum for the transaction of business.

Special meetings of the Executive Council may be called by request of five of its members, giving two weeks' notice to the Secretary desiring him to call such special meeting.

The Executive Council shall provide—first, for keeping the

records of the proceedings of their own meetings as well as that of the Association's annual or special meetings; second, they shall submit to each annual meeting a report, covering their own official acts, as well as a statement of any new or unfinished business requiring attention; third, they shall make full statements of the financial condition of the association; and fourth, shall submit an estimate of the amount required to carry on the affairs of the Association according to their judgment of the business to be done, recommend means for raising money to carry out such plans as may be resolved upon by the Association and raise and disburse the money therefor.

The Secretary shall make and have charge of the records of the Association. These records shall include the correspondence of the Executive Council and that of the Standing Protective Committee. He shall be held responsible for and charged with the safe-keeping of the records of both the Executive Council and the Protective Committee. And it shall be his duty to send promptly to each member of the Association a synopsis of the reports received by him of attempted or accomplished crime against any member of the Association. These records shall be the property of the Association and be held subject at all times to the order of the Executive Council.

The Treasurer shall receive and account for all moneys belonging to the Association, and collect dues; but shall pay out moneys only upon vouchers countersigned and approved by the secretary appointed by the Executive Committee and the President, or by the Chairman of the Executive Council.

The Secretary and Treasurer shall each give to the American Bankers' Association a bond satisfactory in amount and form to the Executive Council.

#### New York State Bankers' Association.

##### 14. e. Officers:—

It shall be the duty of the President to preside at the meetings of the Association, and he shall be Chairman of the Executive Council of Administration.

It shall be the duty of the Vice-President to preside at the meeting of the Association and Council of Administration meetings in the absence of the President.

The Secretary shall make and have charge of the records of this Association, and shall attend to such correspondence as may be necessary.

The Treasurer shall have the custody of the money and property of the association, and shall collect the annual dues and pay the liabilities of the Association upon vouchers approved by the Chairman of the Council of Administration.

American Bankers' Association.

13. f. Meetings:—

The Conventions of the Association are held annually at such times and places as are determined by the Executive Council. Special meetings may be held by the Executive Council on two weeks notice.

New York State Bankers' Association.

14. f. Meetings:—

An annual meeting for the discussion of papers and addresses is held, the same covering two days.

American Bankers' Association.

13. g. Lines of work undertaken:—

In addition to the annual convention at which general matters connected with banking are discussed, there is a Standing Protective Committee of three persons whose names are not made public.

Said committee controls all cases looking to the detection and prosecution of persons attempting to cause or causing loss by crime to any member of the Association. The work of the Protective Committee is carefully organized and it operates under a detailed article of the By-Laws. The Association endeavors to foster interest in the work of State Associations and in this way its usefulness extends beyond its own confines.

New York State Bankers' Association.

14. g. Lines of work undertaken:—

In order to promote the work of the Association the membership is geographically divided into eight groups each containing a few counties and each member on joining the Association selects the group with which he desires to associate. Each group holds at least two meetings each year and may hold four. One of these meetings, called the annual meeting, is to be held not later than December first. At this meeting are discussed important topics connected with the work of the several groups and the groups are expected to present annual reports at the annual meeting of the Association. The group plan, as it is called, may be more fully understood from the following quotation:

"The state is divided into eight geographical groups or districts, comprising from six to nine counties, with one central city as a meeting place. Meetings of the Bankers of each group are held quarterly on the third Saturday of September, December, March and June.

"Each group is controlled by an Executive Committee of five.

"The Chairman of each group, together with the officers of the general Association, constitute a Council of Administration, which directs the affairs of the whole association. This Council also meets quarterly, immediately after the meeting of the group. Once a year the whole association meets at some central city.

"The Chairmen of the various groups come to the Council meetings posted as to the local needs and interests that have come up at the recent Convention of their own section, and these the Council is enabled to take up and act upon.

"In this way the affairs of the association are both localized and centralized."

#### American Bankers' Association.

##### 13. h. Dues:—

The annual dues of the members of the Association shall be \$5.00 for Banks and Trust Companies having an aggregate capital and surplus of less than \$50,000, private bankers and banking firms; \$10.00 for Banks and Trust Companies having an aggregate capital and surplus of \$50,000 and less than \$100,000; \$15.00 for Banks and Trust Companies having an aggregate capital and surplus of \$100,000 and less than \$500,000; \$20.00 for Banks and Trust Companies having an aggregate capital and surplus of \$500,000 and less than \$1,000,000; \$30.00 for Banks and Trust Companies having a capital and surplus of \$1,000,000 and over.

#### New York State Bankers' Association.

##### 14. h. Dues:—

"The annual dues of this association shall be ten dollars (\$10.00) for banks having a capital of \$200,000 or less; \$15.00 for banks from \$200,000 to \$500,000; \$20.00 for banks with capital of over \$500,000 until otherwise ordered. Any application by a private banker for membership shall be first approved by two members of the group he desires to join and shall be passed upon by the Executive Committee of the group."

PROPOSED CONSTITUTION AND BY-LAWS  
OF THE AMERICAN ELECTRIC RAILWAY ASSOCIATION  
CONSTITUTION.

Name.

I. The name of the Association shall be "The American Electric Railway Association," and its office shall be in the city of New York.

Objects.

II. The objects of this association shall be as follows:

- a. The discussion and recommendation of methods for the management and operation of electric railways.
- b. The establishment and maintenance of a spirit of fraternity among the members by social intercourse, and the encouragement of friendly relations between the roads and the public.
- c. Through the medium of branch or affiliated organizations the acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of electric railways and the diffusion of this knowledge among the members with a view of increasing the accommodation of passengers, improving the service and reducing its cost.

Members.

III. The membership of this Association shall consist of two classes as follows:

The ACTIVE MEMBERS of the Association shall consist of American Electric Railway Companies, or lessees, or individual owners of electric railways; and each member shall be entitled to one vote. Said vote may be cast by the properly accredited delegate.

The ASSOCIATE MEMBERS of the Association shall consist of individuals who have at some time been actively identified with electric railway interests and other persons who, in the opinion of the Executive Committee have had experience of such a nature as to render desirable their connection with the Association. Associate members shall enjoy all the privileges of active membership, excepting those of voting and of holding office.

Amendment.

IV. This Constitution may be amended by a two-thirds vote of the members present at a regular meeting, after the proposed amendment shall have been submitted, in writing, at the preceding regular meeting and a copy sent to each of the active members.

## BY-LAWS.

## Applicants.

I. Every applicant for membership shall signify the same, in writing, to the Secretary, enclosing the requisite fee, and shall sign the Constitution and By-Laws.

## Officers and Executive Committee.

II. The Officers shall consist of a President, three Vice-Presidents and one member from each of the branch or affiliated associations who shall constitute the Executive Committee, and a Secretary and Treasurer. The representatives of the branch or affiliated associations shall be appointed by their respective associations.

The Executive Committee shall have the entire charge and management of the affairs of the Association. The officers and Executive Committee shall be elected by ballot, at each regular meeting of the Association, and shall hold office until their successors shall be elected. A two-thirds vote of the members present at any meeting of the Executive Committee shall be necessary to a decision. The duties of the Secretary and Treasurer may be performed by the same person. The Secretary and the Treasurer shall not be members of the Executive Committee and may or may not be identified with active members of the association.

## Duties of Officers.

III. The officers of the Association shall assume their duties immediately after the close of the meeting at which they are elected; they shall hold meetings at the call of the President, or, in his absence, at the call of the Vice-Presidents in their order, and make arrangements for carrying out the objects of the Association.

## President.

IV. The President, if present, or in his absence, one of the Vice-Presidents, in their order, if present, shall preside at all meetings of the Association and of the Executive Committee.

## Treasurer.

V. The duties of the Treasurer shall be to receive and safely keep all moneys of the Association; to keep correct accounts of the same, and pay all bills approved by the President; and he shall make an annual report to be submitted to the Association. He shall give a bond to the President in such sum, and with such sureties, as shall be approved by the Executive Committee.

**Secretary.**

VI. The duties of the Secretary shall be to take minutes of all proceedings of the Association and of the Executive Committee and enter them in books proper for the purpose. He shall conduct the correspondence of the Association, read minutes and notices at all meetings, and also papers and communications, if the authors wish it.

The Secretary shall maintain an office in the city of New York at which shall be on file for the benefit of the members a collection of information in regard to all matters affecting the operation of electric railways.

The Secretary shall attend to the publication of the proceedings of this Association as well as those of the branch or affiliated organizations. He shall perform whatever duties may be required in the Constitution and By-Laws appertaining to his department and such other duties as shall be assigned to him by the Executive Committee. He shall be paid a salary to be fixed by the Executive Committee.

**Meetings.**

VII. The regular meeting of the Association shall be held at such time between the fifteenth day of September and the fifteenth day of December, in each year, as the Executive Committee may decide to be best suited to the locality in which the meeting is to be held; the time to be decided upon and each member of the Association notified of the selection by the first day of March in the year in which the meeting is to be held. Special meetings may be held upon the order of the Executive Committee. Notice of every meeting shall be given by the Secretary, in a circular addressed to each member, at least thirty days before the time of the meeting. Fifteen members constitute a quorum of any meeting.

All sessions excepting those of an executive nature shall be open to all members, who shall have the privilege of discussing all reports and papers presented. Active members only shall attend executive sessions unless a special invitation is extended to others by the presiding officer.

**Order of Business. (1).**

VIII. At the regular meeting of the Association the order of business shall be:

1. The reading of the minutes of the last meeting.
2. The address of the President.

3. The report of the Executive Committee on the management of the Association during the previous year.
4. The report of the Treasurer.
5. Reports of Special Committees.
6. The election of Officers.
7. Reports of Standing Committee.
8. The reading of reports from the Affiliated Associations.
9. The reading and discussion of papers of which notice has been given to the Secretary, at least thirty days prior to the meeting.
10. General business.

Order of Business. (2).

IX. At other general meetings of the Association, the other business shall be the same, except as to the 3d, 4th, and 6th clauses.

Notices.

X. The Secretary shall send notices to all members of the Association at least thirty days before each meeting, mentioning the papers to be read and any special business to be brought before the meeting.

Executive Committee.

XI. The Executive Committee shall meet one hour before each meeting of the Association; and on other occasions when the President shall deem it necessary, upon such reasonable notice as the Committee shall, by vote, determine, specifying the business to be attended to.

Standing Committees.

XII. In order to obtain continuity of the work and uniformity of general purpose the following Standing Committees shall be appointed each year by the Executive Committee:

A COMMITTEE ON SUBJECTS to select topics for the work of the American Electric Railway Association and the allied associations for each year in advance. This committee shall be composed of three members from the central organization and one from each of the branch or affiliated associations. The committee shall present its plans for the coming year at each annual meeting.

An EDITING COMMITTEE the duty of which it shall be to prepare for publication all papers and reports. This committee shall consist of one member from the American Electric Railway Association and one from each of the branch or affiliated associations.

A COMMITTEE ON CONVENTIONS AND EXHIBITS, consisting of two members of the parent association and one from each of the branch or affiliated associations and one from the Manufacturers' Committee. This committee shall have charge of the plans for the exhibit and entertainment features of conventions.

Voting.

XIII. All votes except as herein otherwise provided, shall be *viva voce*; and in case of a tie, the presiding officer may vote.

Non-Members.

XIV. Any member, with the concurrence of the presiding officer, may admit a friend to each meeting of the Association; but such person shall not take any part in the discussion, unless permitted by the meeting.

Reading of Papers.

XV. All papers read at the meetings of the Association must relate to matters connected with the objects of the Association, and must be approved by the Executive Committee before being read, unless notice of the same shall have been previously given to the Secretary, as hereinbefore provided.

Branch or Affiliated Organizations.

XVI. This Association shall do all in its power to promote the welfare of other associations organized to investigate technical matters connected with electric railway operation. To this end, it will in the following ways and in others which may be determined by the Executive Committee, assist in the work of such associations:

By granting charters to and approving the constitution of such associations.

By admitting to the Executive Committee a member from each of such organizations.

By granting financial assistance for specific purposes.

By editing, printing and binding the reports of their proceedings.

Through its Secretary and Committees it will assist in arranging for conventions, suggesting suitable subjects for investigation; it will file information for reference and in every way endeavor to stimulate interest in all of the affiliated organizations.

**Papers, Drawings and Models.**

XVII. All papers, drawings and models submitted to the meeting of the Association shall remain the property of the owners, subject, however, to retention by the Executive Committee for examination and use, but at the owner's risk.

**Fees.**

XVIII. Members shall pay an admission fee of twenty-five dollars, and annual dues of ten dollars, payable in advance. In addition there shall be an annual assessment made by the Executive Committee and based upon the gross annual receipts. The Executive Committee shall have no power to expend, for any purpose whatever, an amount exceeding that received, as hereinbefore provided.

**Arrears.**

XIX. No member whose annual payment shall be in arrears shall be entitled to vote.

**Withdrawal.**

XX. Any member may retire from membership by giving written notice to that effect to the Secretary, and the payment of all annual dues to that date, but shall remain a member and liable to the payment of annual dues until such payments are made, except as hereinafter provided.

**Expulsion.**

XXI. A member may be expelled from the association by ballot of two-thirds of the members voting at any regular meeting of the Association, upon written recommendation of the Executive Committee.

**Rules of Order.**

XXII. All rules not provided for in these By-Laws shall be those found in Roberts' Rules of Order.

**Amendment.**

XXIII. All propositions for adding to or altering any of these By-Laws shall be laid before the Executive Committee, which shall bring them before the next regular meeting of the Association, if it shall think fit; and it shall be the duty of the Committee to do so, on request, in writing, of any five members of the Association.

## Copies of Constitution and By-Laws.

XXIV. Each member of the Association shall be furnished by the Secretary with a copy of the Constitution and By-Laws of the Association, and also a list of the members.

SUGGESTED FORM OF CHARTER TO BE GRANTED BY THE  
AMERICAN ELECTRIC RAILWAY ASSOCIATION  
TO ITS AFFILIATED ASSOCIATIONS.

The American Electric Railway Association in order to promote the acquisition of experimental, statistical and scientific knowledge relative to the construction, equipment and operation of electric railways, and the diffusion of the knowledge among those persons interested in the improvement of electric railway service and the reduction of its cost, hereby agrees to co-operate in the work of the Electric Railway ..... Association in the following ways:

1. By admitting to the Executive Committee of the Association a member of the ..... .
2. By making financial grants for the work of the Standing and Special Committees.
3. By editing, printing and binding the reports of the proceedings.
4. By suggesting subjects for investigation and in every way encouraging such investigations.
5. By managing details of conventions and other meetings.
6. By collecting and filing for reference such information as may be desired by the members of the ..... Association.

On its part, and in consideration of this assistance, the ..... Association agrees that the American Electric Railway Association shall, through its Executive Committee, have the following rights and privileges in connection with the work of said Association:

1. The Constitution and By-Laws shall be subject to the approval of the American Electric Street Railway Association and all amendments to and changes in the same shall be subject to such approval.
2. The American Electric Railway Association reserves the right to withdraw its support and assistance whenever, in the judgment of its Executive Committee, the said ..... Association is not satisfactorily accom-

plishing its objects as stated in Article II of the Constitution of the said Association.

In witness of this agreement, we, the Presidents and Secretaries of the American Electric Railway Association and ..... Association have affixed our signatures here-to, this day of 190

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Secretary A. E. R. A.

President A. E. R. A.

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Secretary .....

President .....

Mr. Beggs—What is the broad general scheme, before getting down to discuss the details? I would like to know what the general plan is as to the future of the American Street Railway Association and the affiliated organizations which have grown out of the discussion of the matter. I was not able to attend the February meeting.

Professor Norris—This plan comprehends bringing into the direct control of the parent association all of the affiliated associations, by several methods of control, and yet for the specific matters of each association, each is allowed to a certain extent to carry out its own program. This plan comprehends the approval by the parent association of the constitution and by-laws of each affiliated association and no change can be made in the by-laws or constitution of such association without the approval of the parent association. That gives the parent association absolute control of the affiliated organizations.

Mr. Beggs—You have sprung a mine when you raise the question that they shall have a constitution and by-laws. That of itself contemplates an independent organization the same as a state under the general government. I disagree with that. We have come to a time when it is necessary to have a radical change.

Mr. Goodrich—Do you believe in separate meetings of the different organizations?

Mr. Beggs—My idea is to have standing committees of the main organization on matters pertaining to the work of the master mechanics, the accountants, etc., and the chairmen of these committees shall be a member of the Executive Committee of the main association. Such committees, instead of meeting as independent organizations, levying and collecting dues, and having an entirely independent existence, should meet as committees

of the American Street Railway Association—the same as committees of Congress meet to consider matters. Any member of the Association who is interested in matters to be considered by the committees could appear before it.

President Ely—It seems to me, Mr. Beggs, from what you have said that if you will listen to the reading of the whole plan and see how these independent and affiliated organizations and their work are brought under the control of this association, I think you will become convinced, as we have been, that far more work can be accomplished and far better results secured in this way than in the way which you outline.

Mr. Beggs—I do not see how it is possible to bring these affiliated organizations under our control when you start off with a constitution and by-laws which constitutes them independent organizations. My idea is that it would be better if each were a permanent standing committee, with a chairman, for example a committee selected from the master mechanics' division, and the work would be done in a manner similar to the committees in Congress, with the chairman of the committee a member of the Executive Committee of the parent association. They would hold committee meetings instead of association meetings. They would discuss matters and bring in their conclusions in the form of recommendations to be finally passed upon by the parent association. I do not see how you are going to constitute a body with a constitution and by-laws and then render it subordinate to the main association in such a way as to give the main association that degree of direction over their affairs and final approval which it ought to have.

Professor Norris—The plan was by granting charters by the parent association to the affiliated associations, to reserve certain rights to the parent association, a certain control over each independent association, but to encourage the independent associations to develop their own broad fields by giving them as much freedom as possible, and yet, at the same time, preserving control in the central body. In addition to the control I have already mentioned in regard to the approval of the constitution and by-laws another means of control would be through the financial end. Instead of having all the complicated collections of dues as now, the plan is that the company members should be members of the American Street Railway Association, their dues would pay the expenses of all the group of associations, but instead of paying a half dozen membership fees they pay only

one annual assessment and they would lay out lines of work for these different associations, which are virtually committees as Mr. Beggs outlines them, except that by giving them a constitution and by-laws they have more of the semblance of associations, and more encouragement to develop along their own lines, because they have more individuality. My idea is that there would be a central committee on recommendations. This committee would lay out the work of all the associations for a year. On that committee, of course, there would be a representative from each of the associations, so that the committee as a whole would be advised as to what were the profitable subjects for investigation in each association. The main association would also vote the necessary money to carry on the work of the affiliated associations. These are the methods of control which make it possible for the parent association to put its stamp of approval or disapproval on any changes in the method and scope of work of the affiliated associations. A further point is, that it is proposed that the proceedings of all of the associations be treated as if they were the proceedings of the American Street Railway Association and bound into one volume. It would seem that the committee idea is included in our plan, although we do not include them in our plan as standing committees—they have the name of associations. They have control of their own meetings, but their work is very largely laid out by the central association and it is subject to the approval of the central association. The only difference seems to be whether they shall be called separate associations or not. We have provided for separate associations with the idea of encouraging individual effort in the various associations as far as possible. They would work along lines applying to the respective individual associations. The parent association would then devote itself to general work, discussing matters pertaining to the management of companies and other general questions and it would devote its time to improving the work of the affiliated associations. It seems to me that these associations would do better work as associations than as committees.

President Ely—I think the affiliated associations would do better work as associations than as committees. The work of the Accountants' Association has attained great prominence. It has come to the attention of the various State Boards of Railroad Commissioners. They are very close to our State Boards and commissioners, have been quite close personal friends of

mine for a number of years. I know that they value the work of the Accountants' Association very highly. I hardly think it is possible that the accountants would have done such efficient work if it had been conducted along the lines of committee work. They must have officers who have the authority to represent them. The results of the work of the Accountants' Association has been such as to raise the whole standard of our business. The idea is to so direct the work of these different organizations that they work harmoniously and along certain related lines during certain times, and they would be within the general purview of the Executive Committee during that specific period. The idea is to control and direct the work of these associations, but not take away from them the opportunity and desire for initiative. If a man is a good accountant and stands well with those in the same line of business he is elected President of the Accountants' Association. That is an incentive for the man to work and make sacrifices, much more so than if he is the chairman of a committee of the American Street Railway Association having charge of the Accounting Department.

Mr. Beggs—I think the work of this Association is generally admitted to have been unsatisfactory for some years past and that something must be done to improve conditions. I believe that in ten years the electrical railway interests of this country will be at least the equal of the steam roads. You have got to put yourselves on a different plane. You have got to measure up the new conditions.

President Ely—This plan is the result of careful study of the whole situation, taking in the view of the conditions of the business as they exist today and are likely to exist in the future.

Mr. Goodrich—I think the plan is a good one and I approve it thoroughly. I think the officers in the parent association will have absolute control over the affiliated associations. I believe there will be a greater development of the affiliated associations if the plan presented is adopted. The heads of the companies will dictate the policies of these affiliated associations. My Auditing and Claim Departments will represent the sentiment of my company. I think we will get better results by encouraging these associations to develop their work somewhat independently. I believe the plan is worthy of a trial. I think it is a step in advance.

Mr. Beggs—We have not run this association as we would run our properties. That is the reason I am injecting these rather

pointed remarks at this time, with the object of showing that a radical departure is necessary if we are going to render the American Street Railway Association effective and keep it abreast of the advance which the industry we represent must take. I desire to see it put upon a plane which will be creditable to those who gave their entire lives to the business, in which our fortunes are invested, and to which our best energies are devoted.

Mr. Goodrich—I think it would be better if we could hold the meetings of these various associations at different times. They could take more time, and instead of confining their meetings to two or three days, they might take a week. It seems to me we are moving in the right direction. If the parent association dictates what subjects shall be taken up and give them plenty of time, we will get good results. There is no doubt that some minor changes may have to be made in the plan, but I think we should give it a trial.

Mr. Beggs—I am perfectly satisfied, so far as I am concerned, to take my chances of having such ideas as the company I represent may have on these various matters given at least careful consideration in these affiliated associations by constituting them absolutely distinct and independent, meeting at such times as may be most convenient, as Mr. Goodrich suggested; for instance the superintendents of construction and maintenance of way meeting in the winter when the companies are not doing any of that class of work; let them meet for a week if you see fit. If some of us desired to attend their meeting well and good. The representatives from the individual companies will know the general policy of the companies, and I am willing therefore to take my chances as to what may be done at these meetings by the representatives of the interests I am charged with the administration of. I believe on further consideration it would be the best step to take to constitute these various organizations distinct and independent. I believe that the time has gone by, that the interests we represent are too far reaching and of too great magnitude to keep these organizations subordinate; give them, as it were, a separate existence and yet control that existence. A few of the large companies will, after all, if the men give their time and attention to these associations, dictate the policy of these organizations. I may say that the American Street Railway Association and its Affiliated Associations have not been of great advantage to the companies I represent. We would have had

what we have had, whether it existed or not, because it was to a great extent a part of our method of doing business.

President Ely—It seems to me, upon a review of the whole situation since the association was organized, that the association has been a great benefit. I should say it was a great benefit to every company that has been a member of it, although the officers of such company may have been unconscious of the benefit received; but I agree with Mr. Beggs that the benefits have not been what they should have been. The matter we are discussing now is how to get the associations together in a coherent, intelligent way, control all the work that is done by them and make them of the greatest value to the members.

I would like to make open avowal of what has been in my mind. It has seemed to me that what we were about to undertake in view of the existing organizations, was a very radical thing and should be proceeded upon with a great deal of care, so that no mistakes might be made, to the end that when the final result is laid down it would make a good working organization, wherein the work would be high toned and efficient and controlled by those who pay the bills.

Mr. Beggs—I desire to apologize for the amount of time I have taken; but I wish to interject this shot at the beginning of our meeting so it might start a train of thought in the minds of my associates among the Officers and Executive Committee of the American Street Railway Association. I ask your indulgence for the time taken.

President Ely—Mr. Parsons has just come in response to an invitation of the President and Secretary. We appreciate very much indeed the call of Mr. Parsons. Mr. Parsons, the situation is a new one. We are meeting in Philadelphia pursuant to the new plan of going where the majority of the members desire to go without waiting for an invitation, which used to be extended under the old plan, which every one seems to feel was more or less burdensome on the local companies. We have come to Philadelphia because we like the city and because of its excellent system, the popularity of its officers and the things we wanted to see, and not to impose ourselves upon Mr. Parsons' company in any way. This being the first move of this kind, is the reason why I speak about it. Mr. Parsons has been very gracious about the matter and has recognized the situation as we all do; and I trust that all the subsequent proceedings will

be so conducted that the first step in the new departure will be found to justify it.

Mr. Parsons—I am not familiar with the recent work or the association, not having attended a meeting for some years. I never believed in the methods of the past, so far as invitations to cities are concerned, not because of any expenditure by the local companies that was entailed by reason of such invitations, but I believe that the dignity and importance of the association warrant it in standing alone, going where it was apparently the best place to go, irrespective of any invitation or entertainments. I have been so situated that I have not been able to take as much interest in the Association as I would like to have done, but that is neither here nor there. Anything that we can do to facilitate your meeting here we will be glad to do. We are not parsimonious or close, but my objection to the invitation business has been for the reason stated—the association either has or should have a position of such importance that it should not depend on any one to invite it.

I read rather hurriedly the outline of the plan that has been suggested, but my general impressions of it are favorable, as a departure from the old methods and the taking up of new lines of work. I can only repeat that whatever we can do to facilitate the general improvement of the association we will be glad to do.

President Ely—Gentlemen, we will now take up the general consideration of the plan as presented by Professor Norris.

Before doing that I will ask the opinion of several members on the plan.

Mr. Stanley—I believe in the plans as the Professor has laid them out.

Mr. Harrington—I am heartily in favor of the plans, and believe that some very good work can be done under them.

Mr. Ross—For the Accountants' Association I will say that we have discussed the thing pretty thoroughly and I think the general plan is very good. There are some details that might be improved.

Mr. Adams—As a general proposition I think the plans are good.

Mr. Goodrich—I move that the plans be read and we act on each section.

Secretary Penington then proceeded with the reading of the proposed constitution and by-laws, section by section.

After several hours' discussion by the members of the committee the following Constitution and By-Laws were recommended to the Association.

T. C. Penington, Secretary.

## PROPOSED CONSTITUTION AND BY-LAWS OF THE AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.

### CONSTITUTION.

#### Name and Location.

I. a. The name of the Association shall be the "American Street and Interurban Railway Association."

b. The headquarters of the Association shall be located in the City of New York.

#### Objects.

II. The objects of the Association shall be as follows:

a. The discussion and recommendation of methods of construction, management and operation of street and interurban railways, and of safeguarding the interests of the same.

b. The establishment and maintenance of a spirit of co-operation among the members, and the encouragement of friendly relations between the companies and the public.

c. The acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of street and interurban railways and the diffusion of this knowledge among the members.

#### Members.

III. The membership of this Association shall consist of two classes, as follows:

a. Active Members, consisting of American street and interurban railway companies or lessees, or individual owners of street and interurban railways. Each member shall be entitled to one vote, which shall be cast by the properly accredited delegate.

b. Associate Members, consisting of individuals who are or have been at some time actively identified with street and interurban railway interests, and other persons who in the opinion of the Executive Committee have had experience of such a nature as to render desirable their connection with the Association. The privileges of the associate members shall be similar to those of the active members excepting that they shall not be entitled to vote or hold office nor shall they have the privileges of the floor unless permitted by the Association.

**Amendment.**

IV. This Constitution may be amended by a two-thirds vote of the members present at a regular meeting, provided the proposed amendment shall have the approval of the Executive Committee, and provided that a copy shall have been sent to each of the active members at least thirty days prior to the date of the meeting at which the proposed amendment is to be acted upon.

**BY-LAWS.****Election of Members.**

I. Every applicant shall signify his desire to the Secretary, enclosing the requisite fee. All applications for membership shall be referred to the Executive Committee, a two-thirds vote of the members of the Executive Committee by ballot being necessary to election. In case of rejection the membership fee shall be returned. The Executive Committee shall report at each meeting the names of new members elected.

**Officers.**

II. a. The Officers shall consist of a President, Vice-Presidents equal in number to the number of affiliated associations, a Treasurer and a Secretary. The officers shall assume their duties immediately after the meeting at which they are elected.

b. The President, Vice-President and Treasurer of the Association shall be elected at the Annual Meeting of the Association. All such elections shall be by ballot, and a majority of the votes of all members present shall be necessary to an election. The Secretary shall be appointed by the Executive Committee.

**President and Vice-Presidents.**

III. The President shall be the chief executive officer of the Association. He shall preside at the meetings of the Association and of the Executive Committee. In the absence of the President any duties devolving upon him may be performed by one of the Vice-Presidents.

**Treasurer.**

IV. The duties of the Treasurer shall be to receive, safely keep and account for all moneys of the Association; to keep correct accounts of the same, and to pay all bills approved by the President. He shall make an annual report to be submitted to the Association. He shall give a bond to the President in such sum,

and with such sureties, as shall be approved by the Executive Committee. He shall be paid a salary fixed by the Executive Committee.

Secretary.

V. The duties of the Secretary shall be as follows:

- a. To take minutes of all proceedings of the Association and of the Executive Committee and to enter them in books proper for the purpose.
- b. To conduct the correspondence of the Association.
- c. To read minutes and notices at all meetings and to present papers and communications if the authors wish it.
- d. To collect and file for the benefit of the members information and statistics regarding matters relating to the purposes of the Association.
- e. To receive applications for membership and to lay such before the Executive Committee.
- f. To attend to the publication of the proceedings of this Association; and, in conjunction with the Secretaries of the affiliated associations, to the publication of the proceedings of such affiliated associations.
- g. To send notices to all members of the Association at least thirty days before each meeting, mentioning papers to be read and any special business to be brought before the meeting.
- h. To perform such other duties as may be required of him by the Constitution and By-Laws, and such duties as may be assigned to him by the Executive Committee.

The office of the Secretary shall be maintained at the headquarters of the Association. He shall be paid a salary fixed by the Executive Committee. He may or may not be in the employ of an active member of the Association.

The Executive Committee.

VI. a. The entire charge and management of the affairs of the Association shall be in the hands of an Executive Committee, which shall consist of the President, the Vice-Presidents, and one member appointed by each of the affiliated associations. The Executive Committee shall make arrangements for carrying out the objects of the Association.

b. The Executive Committee shall hold a regular meeting before each regular annual meeting of the Association, and shall hold such special meetings as may be necessary. Such special meetings may be called by the President or any five members of

the Executive Committee. Five members of the Executive Committee shall constitute a quorum at all meetings.

The Secretary shall give such reasonable notice of all meetings as the committee shall by vote prescribe, and all such notices shall specify the business to be brought to the attention of the committee at such meetings.

c. The Executive Committee may assign to its allied association, the American Street Railway Manufacturers' Association, the management of the exhibit features of the annual conventions, and it may arrange with the said Manufacturers' Association the details of such entertainments as may be given in connection with the annual conventions of this Association.

d. The Executive Committee shall present a report to each regular annual meeting of the Association, and shall include in such report the names of members elected during the year, and its recommendations for the future work of the Association.

#### Meetings.

VII. a. Regular annual meetings of the Association shall be held at such time between the fifteenth day of September and the fifteenth day of December, in each year, as the Executive Committee may decide to be the best suited to the locality in which the meeting is to be held; the time to be decided upon and each member notified of the selection by the first day of May in the year in which the meeting is to be held. Special meetings may be held upon the order of the Executive Committee. Notice of every meeting shall be given by the Secretary, in a circular addressed to each member, at least thirty days before the time of the meeting. Fifteen members shall constitute a quorum at any meeting.

b. At all meetings of the Association discussion shall be limited to active members, provided, however, that special privileges may be accorded others at the will of the meeting.

c. At any regular or special meeting, executive sessions may be held. Such sessions shall be open to active members only.

#### Order of Business.

VIII. The regular order of business shall be:

1. Reading of minutes of last meeting.
2. Report of the Executive Committee.
3. Address of the President.
4. Report of the Treasurer.
5. Report of Standing Committees.

6. Reports of Special Committees.
7. Reports from Affiliated Associations.
8. Reading and discussion of papers.
9. General business.
10. Election of officers.

Committee on Subjects.

IX. In order to secure continuity of work and uniformity of general purpose, a Committee on Subjects shall be appointed each year by the Executive Committee. The function of this Committee shall be to suggest topics for the work of the American Street and Interurban Railway Association and its affiliated associations for each year in advance.

The Committee shall consist of one member from each of the affiliated associations and a number from the American Street and Interurban Railway Association equal to the total number from the affiliated associations. The Committee, at each annual meeting, shall present its plans for the coming year.

Voting.

X. All votes except as herein otherwise provided shall be *viva voce*; and in case of a tie, the presiding officer may vote.

Reading of Papers.

XI. All papers read at the meetings of the Association must relate to matters connected with the objects of the Association and must have been previously approved by the Executive Committee.

Affiliated Associations.

XII. This Association shall do all in its power to promote the welfare of other associations organized with its approval to investigate technical matters connected with street and interurban railway construction and operation. To this end it will, in the following way, and in others which may be determined by the Executive Committee, assist in the work of such affiliated associations:

- a. By granting charters to and approving the constitutions of such associations.
- b. By admitting to the Executive Committee a member from each of such associations.
- c. By granting financial assistance to such associations for specific purposes.

d. By editing, printing and binding the reports of the proceedings of such associations.

e. Through its Secretary and Committee it will assist in arranging for conventions, suggesting suitable subjects for investigation; it will file information for reference and distribution and in every way endeavor to stimulate interest in all of the affiliated associations.

Papers, Drawings, Etc.

XIII. All papers, drawings and models submitted to the meetings of the Association shall remain the property of the owners; subject, however, to retention by the Executive Committee for examination and use, but at the owner's risk.

Fees.

XIV. Active members shall pay an admission fee of ten dollars and annual dues payable in advance based on gross earnings from railway operation during the preceding fiscal year (ending June 30th) as follows:

Gross receipts under ....\$	100,000	\$ 25.00
Gross receipts between ..	100,000 and \$ 250,000	50.00
Gross receipts between ..	250,000 and 500,000	100.00
Gross receipts between ..	500,000 and 1,000,000	150.00
Gross receipts between ..	1,000,000 and 2,500,000	250.00
Gross receipts between ..	2,500,000 and 5,000,000	350.00
Gross receipts between ..	5,000,000 and 10,000,000	500.00
Gross receipts over .....	10,000,000	600.00

Associate members shall pay in advance an annual fee of five dollars.

Arrears.

XV. No member whose annual payment shall be in arrears shall be entitled to vote.

Withdrawal.

XVI. Any member may retire from membership by giving written notice to that effect to the Secretary, and the payment of all annual dues to that date, but shall remain a member, and liable to the payment of annual dues until such payments are made, except as hereinafter provided.

Expulsion.

XVII. A member may be expelled from the Association by the vote of two-thirds of the members present at any regular meeting of the Association, upon the written recommendation of the Executive Committee.

## Rules of Order.

XVIII. All rules not provided for in these By-Laws shall be those found in Roberts' Rules of Order.

## Amendment.

XIX. All propositions for adding to or altering any of these By-Laws shall be laid before the Executive Committee, which shall bring them before the next regular meeting of the Association, if it shall consider such course desirable; and it shall be the duty of the Committee to do so, on the request, in writing, of any five members of the Association.

## FORM OF CHARTER TO BE GRANTED BY THE AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.

The American Street and Interurban Railway Association, in order to promote the acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of street and interurban railways, and the diffusion of this knowledge among those persons interested in the improvements of street and interurban railway service and the reduction of its cost, hereby agrees to co-operate in the work of the American Street and Interurban Railway \_\_\_\_\_ Association in the following ways:

1. By admitting to its Executive Committee a member of the said affiliated association.
2. By granting financial assistance for specific purposes to the said affiliated association.
3. By editing, printing and binding the reports of the proceedings of said affiliated association.
4. By suggesting subjects for investigation and in every way encouraging such investigation on the part of the said affiliated association.
5. By managing the details of conventions and other meetings for the said affiliated association.
6. By collecting, filing for reference and distributing such information as may be desired by members of the said affiliated association.

In consideration of this assistance, the ..... Association by the acceptance of this charter agrees that the Constitution and By-Laws of the said affiliated Association shall be subject to the approval of the American Street and Interurban Railway Association and all amendments to and changes in the

same shall be subject to such approval; and that the American Street and Interurban Railway Association shall have the right to withdraw its support and assistance whenever, in the judgment of its Executive Committee, the said \_\_\_\_\_ Association is not satisfactorily accomplishing its object as stated in Article II. of the Constitution of the said affiliated Association.

In witness of this agreement, we, the Presidents and Secretaries of the American Street and Interurban Railway Association and of the ..... Association have affixed our signatures hereunto, this .... day of ..... 190....

.....  
Secretary of A. S. & I. R. A.

.....  
Secretary of .....

.....  
President of A. S. & I. R. A.

.....  
President of .....

MINUTES OF THE MEETING OF THE EXECUTIVE COMMITTEE OF THE AMERICAN STREET RAILWAY ASSOCIATION, IN CONFERENCE WITH REPRESENTATIVES OF THE ACCOUNTANTS' ASSOCIATION, THE MECHANICAL AND ELECTRICAL ASSOCIATION AND THE CLAIM AGENTS' ASSOCIATION, HELD AT THE BELLEVUE-STRATFORD, PHILADELPHIA, PA., SEPT. 26, 1905.

President Ely called the meeting to order at 1:45 p. m.

There were present: W. C. Ely, President; John I. Beggs, Second Vice-President; Richard McCulloch, Third Vice-President; John J. Stanley, Calvin G. Goodrich, Frank G. Jones, T. C. Pennington, Secretary and Treasurer, representing the American Street Railway Association; W. G. Ross, Elmer M. White and C. L. S. Tingley, representing the Accountants' Association; H. H. Adams, representing the Mechanical and Electrical Association, and James R. Pratt, representing the Claim Agents' Association.

In consideration of "Proposed Constitution and By-Laws of the American Street and Interurban Railway Association" the Executive Committee recommended as follows:

## CONSTITUTION.

That the matter under "Name and Location" be adopted in its entirety.

That the matter under "Objects" be adopted in its entirety.

That the matter under "Members" be adopted as printed to and including the word "delegate" closing paragraph "a.;" and that paragraph "b." be amended by inserting, after the word "individuals" in the first line, the words "co-partnerships and corporations"; also, that paragraph "b." be further amended by striking out from the second line the words "or have been at some time."

That Article IV, under "Amendment," be amended to read: "shall have the approval of two-thirds of the Executive Committee," instead of as in the printed form.

## BY-LAWS.

That the matter under "Election of Members" be adopted in its entirety.

That the matter under "Officers"—with the correction of "Vice-President" to "Vice-Presidents" in the first line of paragraph "b."—be adopted in its entirety.

That the matter under "President and Vice-Presidents" be adopted in its entirety.

That the matter under "Treasurer" be adopted in its entirety.

That the concluding sentence—"He may or may not be in the employ of an active member of the Association"—be stricken out from the last paragraph under "Secretary"; otherwise that Article V be adopted in its entirety.

That under "The Executive Committee," the first paragraph of sub division "b." be amended to read. "A majority of the members of the Executive Committee shall constitute a quorum at all meetings"; and that the second paragraph of subdivision "b." be amended by the insertion, between the words "shall" and "specify," of the words "as far as practicable." That paragraphs "a." and "c." be adopted as printed.

At this juncture a digression from the regular order of procedure was made to a point under "Affiliated Associations"; and it was determined to recommend the amending of paragraph "c." of Article XII by striking out the words "for specific purposes."

Mr. Beggs moved (seconded by Mr. Goodrich) "That the offices of Secretary and Treasurer may be held by one and the

same person; and that the work of the Treasurer's office shall be performed in the Secretary's office." The motion as stated was regularly put and declared adopted. Paragraph "b." of Article II was then amended to read as follows: "b. The President and Vice-Presidents of the Association shall be elected at the Annual Meeting of the Association. All such elections shall be by ballot, and a majority of the votes of all the members present shall be necessary to an election. The Secretary and Treasurer shall be appointed by the Executive Committee. The offices of the Secretary and Treasurer may be held by one and the same person; and the work of the Treasurer's office shall be performed in the Secretary's office."

Under "The Executive Committee," paragraph "d." was then considered and its adoption recommended.

That the matter under "Meetings" be adopted in its entirety.

That the matter under "Order of Business" be adopted in its entirety.

That the matter under "Committee on Subjects" be adopted in its entirety.

That under "Voting," Article X be amended to conclude: "the presiding officer shall vote."

That the matter under "Reading of Papers" be adopted in its entirety.

That the matter under "Affiliated Associations," as in this meeting previously amended, be adopted.

That the matter under "Papers, Drawings, etc., " be adopted in its entirety.

That the matter under "Arrears" be adopted in its entirety.

That the matter under "Withdrawal" be adopted in its entirety.

That the matter under "Expulsion" be adopted in its entirety.

That the matter under "Rules of Order" be adopted in its entirety.

That the matter under "Amendment" be adopted in its entirety.

That the "Form of Charter to be granted by the American Street and Interurban Railway Association" be eliminated.

Recurring to matter under "Affiliated Associations," it was recommended that paragraph "a." be amended to read: "By authorizing the formation and approving the constitutions of such associations."

It was unanimously recommended that Article XIV be amended to read as follows:

Fees.

XIV. Active members shall pay an admission fee of ten dollars and annual dues payable in advance based on gross earnings from railway operation during the preceding fiscal year of the respective companies, as follows:

	GROSS RECEIPTS	Annual Dues
Under	\$50,000.....	\$15.00
Between	50,000 and \$100,000.....	25.00
"	100,000 " 250,000.....	50.00
"	250,000 " 500,000.....	75.00
"	500,000 " 1,000,000.....	100.00
"	1,000,000 " 2,000,000.....	150.00
"	2,000,000 " 3,000,000.....	200.00
"	3,000,000 " 4,000,000.....	250.00
"	4,000,000 " 5,000,000.....	300.00
"	5,000,000 " 6,000,000.....	350.00
"	6,000,000 " 7,000,000.....	400.00
"	7,000,000 " 8,000,000.....	450.00
"	8,000,000 " 9,000,000.....	500.00
"	9,000,000 " 10,000,000.....	550.00
"	10,000,000 " over.....	600.00

It was moved and carried that the Constitution and By-Laws as read and amended be presented to the convention with the unanimous recommendation that they be adopted.

The President presented the bill of Henry H. Norris, M. E., amounting to \$500.00, which was ordered paid.

REVISED CONSTITUTION AND BY-LAWS OF THE AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION,  
AS PRESENTED TO THE CONVENTION BY THE EXECUTIVE COMMITTEE AND RECOMMENDED FOR ADOPTION.

CONSTITUTION.

Name and Location.

1. a. The name of the Association shall be "The American Street and Interurban Railway Association."

b. The headquarters of the Association shall be located in the City of New York.

Objects.

II. The objects of the Association shall be as follows:

a. The discussion and recommendation of methods of construction, management and operation of street and interurban railways, and of safeguarding the interests of the same.

b. The establishment and maintenance of a spirit of co-operation among the members, and the encouragement of friendly relations between the companies and the public.

c. The acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of street and interurban railways and the diffusion of this knowledge among the members.

Members.

III. The membership of this Association shall consist of two classes, as follows:

a. Active Members, consisting of American street and interurban railway companies, or lessees, or individual owners of street and interurban railways. Each member shall be entitled to one vote, which shall be cast by the properly accredited delegate.

b. Associate Members, consisting of individuals, co-partnerships and corporations who are actively identified with street and interurban railway interests, and other persons who in the opinion of the Executive Committee have had experience of such a nature as to render desirable their connection with the Association. The privileges of the associate members shall be similar to those of the active members excepting that they shall not be entitled to vote or hold office nor shall they have the privileges of the floor unless permitted by the Association.

Amendment.

IV. This Constitution may be amended by a two-thirds vote of the members present at a regular meeting, provided the proposed amendment shall have the approval of two-thirds of the Executive Committee, and provided that a copy shall have been sent to each of the active members at least thirty days prior to the date of the meeting at which the proposed amendment is to be acted upon.

## BY-LAWS.

## Election of Members.

I. Every applicant shall signify his desire to the Secretary, enclosing the requisite fee. All applications for membership shall be referred to the Executive Committee, a two-thirds vote of the members of the Executive Committee by ballot being necessary to election. In case of rejection the membership fee shall be returned. The Executive Committee shall report at each meeting the names of new members elected.

## Officers.

II. a. The officers shall consist of a President, Vice-Presidents equal in number to the number of affiliated associations, a Treasurer and a Secretary. The officers shall assume their duties immediately after the meeting at which they are elected.

b. The President and Vice-Presidents of the Association shall be elected at the Annual Meeting of the Association. All such elections shall be by ballot, and a majority of the votes of all members present shall be necessary to an election. The Secretary and Treasurer shall be appointed by the Executive Committee. The offices of Secretary and Treasurer may be held by one and the same person, and the work of the Treasurer's office shall be performed in the Secretary's office.

III. The President shall be the chief executive officer of the Association. He shall preside at the meetings of the Association and of the Executive Committee. In the absence of the President any duties devolving upon him may be performed by one of the Vice-Presidents.

## Treasurer.

IV. The duties of the Treasurer shall be to receive, safely keep and account for all moneys of the Association; to keep correct accounts of the same, and to pay all bills approved by the President. He shall make an annual report to be submitted to the Association. He shall give a bond to the President in such sum, and with such sureties, as shall be approved by the Executive Committee. He shall be paid a salary fixed by the Executive Committee.

## Secretary.

V. The duties of the Secretary shall be as follows:

a. To take minutes of all proceedings of the Association

and of the Executive Committee and to enter them in books proper for the purpose.

- b. To conduct the correspondence of the Association.
- c. To read minutes and notices at all meetings and to present papers and communications if the authors wish it.
- d. To collect and file for the benefit of the members information and statistics regarding matters relating to the purposes of the Association.
- e. To receive applications for membership and to lay such before the Executive Committee.
- f. To attend to the publication of the proceedings of this Association; and, in conjunction with the Secretaries of the affiliated associations, to the publication of the proceedings of such affiliated associations.
- g. To send such notices to all members of the Association at least thirty days before each meeting, mentioning papers to be read and any special business to be brought before the meeting.
- h. To perform such other duties as may be required of him by the Constitution and By-Laws, and such duties as may be assigned to him by the Executive Committee.

The office of the Secretary shall be maintained at the headquarters of the Association. He shall be paid a salary fixed by the Executive Committee.

The Executive Committee.

VI. a. The entire charge and management of the affairs of the Association shall be in the hands of an Executive Committee, which shall consist of the President, the Vice-Presidents, and one member appointed by each of the affiliated associations. The Executive Committee shall make arrangements for carrying out the objects of the Association.

b. The Executive Committee shall hold a regular meeting before each regular annual meeting of the Association, and shall hold such special meetings as may be necessary. Such special meetings may be called by the President or by any five members of the Executive Committee. A majority of the members of the Executive Committee shall constitute a quorum at all meetings.

The Secretary shall give such reasonable notice of all meetings as the committee shall by vote prescribe, and all such notices shall, as far as practicable, specify the business to be brought to the attention of the committee at such meetings.

c. The Executive Committee may assign to its allied association, the American Street Railway Manufacturers' Association,

the management of the exhibit features of the annual conventions, and it may arrange with the said Manufacturers' Association the details of such entertainments as may be given in connection with the annual conventions of this Association.

d. The Executive Committee shall present a report to each regular annual meeting of the Association, and shall include in such report the names of members elected during the year, and its recommendations for the future work of the Association.

#### Meetings.

VII. a. Regular annual meetings of the Association shall be held at such time between the fifteenth day of September and the fifteenth day of December, in each year, as the Executive Committee may decide to be best suited to the locality in which the meeting is to be held; the time to be decided upon and each member notified of the selection by the first day of May in the year in which the meeting is to be held. Special meetings may be held upon the order of the Executive Committee. Notice of every meeting shall be given by the Secretary, in a circular addressed to each member, at least thirty days before the time of the meeting. Fifteen members shall constitute a quorum at any meeting.

b. At all meetings of the Association discussion shall be limited to active members, provided, however, that special privileges may be accorded others at the will of the meeting.

c. At any regular or special meeting, executive sessions may be held. Such sessions shall be open to active members only.

#### Order of Business.

VIII. The regular order of business shall be:

1. Reading of minutes of last meeting.
2. Report of the Executive Committee.
3. Address of the President.
4. Report of the Treasurer.
5. Reports of Standing Committees.
6. Reports of Special Committees.
7. Reports from affiliated associations.
8. Reading and discussion of papers.
9. General business.
10. Election of officers.

#### Committee on Subjects.

IX. In order to secure continuity of work and uniformity of general purpose, a Committee on Subjects shall be appointed

each year by the Executive Committee. The function of this Committee shall be to suggest topics for the work of the American Street and Interurban Railway Association and its affiliated associations for each year in advance.

The Committee shall consist of one member from each of the affiliated associations and a number from the American Street and Interurban Railway Association equal to the total number from the affiliated associations. The Committee, at each annual meeting, shall present its plans for the coming year.

#### Voting.

X. All votes except as herein otherwise provided shall be *viva voce*; and in case of a tie, the presiding officer shall vote.

#### Reading of Papers.

XI. All papers read at the meetings of the Association must relate to matters connected with the objects of the Association and must have been previously approved by the Executive Committee.

#### Affiliated Associations.

XII. This Association shall do all in its power to promote the welfare of other associations organized with its approval to investigate technical matters connected with street and interurban railway construction and operation. To this end it will, in the following ways, and in others which may be determined by the Executive Committee, assist in the work of such affiliated associations:

a. By authorizing the formation and approving the constitutions of such associations.

b. By admitting to the Executive Committee a member from each of such associations.

c. By granting financial assistance to such associations.

d. By editing, printing and binding the reports of the proceedings of such associations.

e. Through its Secretary and Committee it will assist in arranging for conventions, suggesting suitable subjects for investigation; it will file information for reference and distribution and in every way endeavor to stimulate interest in all of the affiliated associations.

#### Papers, Drawings, Etc.

XIII. All papers, drawings and models submitted to the meetings of the Association shall remain the property of the

owners; subject, however, to retention by the Executive Committee for examination and use, but at the owner's risk.

Fees.

XIV. Active members shall pay an admission fee of ten dollars and annual dues payable in advance based on gross earnings from railway operation during the preceding fiscal year of the respective companies as follows:

GROSS RECEIPTS			Annual Dues
Under	\$50,000.....		\$15.00
Between	50,000 and	\$100,000.....	25.00
"	100,000 "	250,000.....	50.00
"	250,000 "	500,000.....	75.00
"	500,000 "	1,000,000.....	100.00
"	1,000,000 "	2,000,000.....	150.00
"	2,000,000 "	3,000,000.....	200.00
"	3,000,000 "	4,000,000.....	250.00
"	4,000,000 "	5,000,000.....	300.00
"	5,000,000 "	6,000,000.....	350.00
"	6,000,000 "	7,000,000.....	400.00
"	7,000,000 "	8,000,000.....	450.00
"	8,000,000 "	9,000,000.....	500.00
"	9,000,000 "	10,000,000.....	550.00
	10,000,000 "	over.....	600.00

Associate members shall pay in advance an annual fee of five dollars.

Arrears.

XV. No member whose annual payment shall be in arrears shall be entitled to vote.

Withdrawal.

XVI. Any member may retire from membership by giving written notice to that effect to the Secretary, and the payment of all annual dues to that date, but shall remain a member, and liable to the payment of annual dues until such payments are made, except as hereinafter provided.

Expulsion.

XVII. A member may be expelled from the Association by

the vote of two-thirds of the members present at any regular meeting of the Association, upon the written recommendation of the Executive Committee.

Rules of Order.

XVIII. All rules not provided for in these By-Laws shall be those found in Roberts' Rules of Order.

Amendment.

XIX. All propositions for adding to or altering any of these By-Laws shall be laid before the Executive Committee, which shall bring them before the next regular meeting of the Association, if it shall consider such course desirable; and it shall be the duty of the Committee to do so, on the request, in writing, of any five members of the Association.

President Ely: It is now one o'clock. Shall we proceed to read the proposed Constitution and By-Laws, and then take it up for discussion after recess, or shall we take a brief recess and then take up the matter of the proposed Constitution and By-Laws and get through with it?

Mr. W. Worth Bean, St. Joseph, Mich.: Mr. President, I move that we adjourn until two o'clock, and on our return take up the Constitution and By-Laws, and remain in session until the matter is concluded. (The motion was agreed to, and the meeting was adjourned until two o'clock, p. m.)

*WEDNESDAY AFTERNOON SESSION.*

President Ely called the meeting to order at 2:15 o'clock.

President Ely: We will now take advantage of a lull in the business to announce that sometime since I addressed a letter in my official capacity, to the presidents of all the various Street Railway Associations and Clubs in the different states where they have such organizations, and in the communication the thought was conveyed that we hoped soon to see all street railway organizations working in unison and co-operatively. I asked for suggestions from the presidents of these clubs and associations, and I am pleased to state that in every instance, I received replies. Some of them were most interesting,

approving the idea suggested, that it would be easy to arrive at a means whereby the work of the State Associations in the different States might be carried on along the same lines as that of your organization and of the affiliated organizations. Some of the associations formally designated delegates to represent the Association here, among them the following:

The New England Street Railway Club designated Mr. E. E. Potter.

The Ohio Interurban Railway Association designated Mr. Fred W. Green and Mr. Harry P. Clegg.

The New York State Street Railway Association designated Mr. J. H. Pardee.

The Massachusetts Street Railway Association designated Messrs. E. P. Shaw, F. H. Dewey, R. S. Goff, E. E. Potter, and H. C. Page.

I also wrote letters of invitation to attend this meeting to all the past presidents of the Association. We have letters of regret from Messrs. D. F. Longstreet, Robert McCulloch, J. M. Roach, C. B. Holmes, Thomas Lowry, Henry M. Watson, and H. M. Littell. Some of these gentlemen took occasion to refer to the matter of the plan of reorganization in a very commendatory way.

I also sent an invitation to some of the members of the different State Boards of Railway Commissioners, and have regrets from some of these.

I also sent an invitation to the President of the National Association of Railroad Commissioners. One object I had in sending these communications was to see what they would bring forth, and it is very pleasing to see a general manifestation of interest.

The Executive Committee decided that it would be a very nice thing if we could secure the attendance of Mr. Henry L. Doherty, who was chiefly instrumental in bringing order out of chaos in the National Electric Light Association, and giving it a splendid organization, with results that are very gratify-

ing to the leading men interested in that branch of the business. Mr. Doherty has kindly consented to come and give us a talk, and I now have great pleasure in introducing him to you.

Mr. Doherty: Mr. President, and gentlemen, it was a pleasure to come over to Philadelphia and address such a body as the American Street Railway Association. This is my first convention, but I hope it will not be my last, in fact, I hope to be a regular attendant upon your meetings in the future. I have prepared an article on organization, but will not attempt to read it in full, but extract from it. I have been engaged primarily in the Gas and Electric business, and identified with the Association work in those fields.

Mr. Doherty then addressed the Convention.

#### ADDRESS OF MR. DOHERTY.

Your President requested me to address you on the subject of "better Association results." The request was received while I was in the midst of important work which I have been unable to complete and was only able to undertake this work last Monday evening.

#### Improvement in Association Work.

I have been engaged primarily in the Gas and Electric business and have been identified with Association work in these fields. This is probably the reason your President was prompted to honor me by asking me to address this important body.

The line of work I have followed has enjoyed a rapid development and holds great possibilities, but cannot be compared with the Traction business. In fact, the opportunities opened to the experienced Traction operator are so great and unlimited as to warrant jealousy on the part of the operators in other lines.

All of you are directly or indirectly interested financially in the development of this business and you are also interested sentimentally in its advancement. The development of this business will depend largely upon the scope and quality of your Association, and the future of the Association will depend upon the proper planning of the organization, the quality of the work it does, and most important of all, upon the support it receives from its members and to what extent the Traction interests support the organization by becoming members.

**The Necessity for Reorganization.**

I understand a reorganization plan is to be offered to this convention and I regret that I have been unable to study this plan. It is hardly probable that any change has been made in your organization or the general character of its work, for many years, and yet the industry has grown by leaps and bounds. Its future aspect has changed and it is hardly probable that the organization planned and executed many years ago for a then relatively unimportant industry is sufficient for this new giant industry whose growth has been phenomenal and whose possibilities are almost beyond comprehension. The plans you adopt now may not be final. The industry must have an extensive organization to meet the needs of its future growth and must provide for this future growth by some scheme for automatic expansion or must be reconsidered and changed from time to time as growth of industry dictates.

**Scope of Work.**

I never realized so keenly the scope or perplexity of this industry until faced with the responsibility of delivering an address upon the Association work it demands. It seemed to me after serious thought, to demand every branch of diplomacy, financiering, engineering and commercialism. The wide scope of work not only dictates the necessity for wise planning of the individual company organization, but an equally wise and comprehensive organization of your Association.

Your work requires a knowledge of thermo-dynamics, mechanical engineering, electrical engineering, legal matters, materials, amusements, municipal engineering and especially regarding paving, proper relations with State and Municipal authorities, the newspapers and the general public. Your Association, to administer Association benefits to the full extent of its possibilities, must be comprehensive and therefore probably complex and extensive.

**Opposition to Changes.**

Proposed changes in every organization are apt to meet with opposition from chronic objectors to progress. It is also not unusual to find changes opposed by men of undisputed standing and ability, whose success in their business lends much weight to their views. These men are apt to preach progress only along lines which they choose to term "demonstrated good practice," and oppose all changes on the ground of being experiments. They

forget that while all changes are not improvements, yet all improvements are the result of changes and for better results, changes must be made.

#### **Suggested Organization.**

To have some plan in front of me which can be used as an example in discussion, I will suggest a certain form and character of organization. This suggested plan is not intended to be a serious and final recommendation, but simply a suggestion which may bring out in this paper or in the discussion which may follow, certain good objects which should be kept in mind if their beneficial results are to be obtained.

I would suggest that the Association be known as "THE AMERICAN TRACTION ASSOCIATION," because this title seems to be comprehensive, reasonably concise and not cumbersome.

I would urge the necessity of well located, well equipped and well operated permanent headquarters, under the direction of a permanent Secretary. The headquarters should preferably be in New York City and should be either in the heart of the financial district or in the New Union Engineering Building in 39th Street.

The entire organization of the association should be primarily intended to protect and develop the interests of existing properties and ample funds should be provided from these properties to properly maintain the organization. The following membership classes are suggested:

##### **First:—Class "A"—Member Companies.**

Being companies operating street and interurban railways. Initiation fee, \$100.00. Annual dues, \$10.00, plus a small percentage of gross receipts, with maximum dues of \$300.00 per year. Dues payable quarterly.

##### **Explanation.**

Member Companies would be represented at each Convention by one accredited delegate authorized to vote for the member company.

Control of the Association in all important details including the election of officers would rest entirely with the member companies. This is recommended because the interests of the property are always the same, while the individual interest may change; as an example, I can easily see how the present General Manager of some important Traction property might become interested in some underground conduit scheme and try to force

all Traction interests underground. To insure that the Association would always be conducted for the interests of the Traction properties, it seems necessary to vest control with the properties.

The initiation fee is placed at \$100 to insure continuity of membership and prevent companies from dropping out. Suggest also the idea of remitting this initiation fee to charter members of a new organization and thus offer some incentive for prompt application for membership.

The annual dues are based on a fixed amount which is supposed to cover expenses common to all properties regardless of size, plus a percentage of gross receipts, based principally on the argument of taxing what the traffic will bear and is a rough approximation of the benefits derived, but a limit of \$300 is suggested as the maximum amount any one company should be expected to pay and in view of the fact that it is perhaps possible that the larger the company, the less they are in need of Association work.

It is intended that this class of membership should contribute the major portion of all revenues needed, and quarterly payment of dues is suggested to make the aggregate payment look smaller.

**Second:—Class “B”—Members.**

Being officers and employees of member companies and to hold membership only by written consent from the company employing them. Initiation fee, \$5.00. Annual dues, \$5.00. Dues payable annually.

**Explanation.**

As provided above the control of the Association rests with the companies and yet the companies as such, cannot participate in the Convention proceedings.

Some companies may wish to send a number of delegates to the Convention and these delegates will want to enjoy some identification with the Association and will want to obtain copies of proceedings. If individual identification is wanted and ability to obtain proceedings, it is only fair that such members should contribute something to the support of the Association.

From the standpoint of the Association, individual membership is desirable as a means of promoting more and better work in behalf of the Association. As the Association is primarily supported by the member companies, they should be allowed to

say who should and who should not be entitled to individual membership.

The initiation fee is placed at a nominal figure only with the idea of encouraging general participation by the officers and employes of all member companies, and the annual dues are also placed at a low figure, intended to cover very little more than the actual expenses occasioned by this class of membership.

**Third:—Class “C”—Members.**

Being officers and employes of Traction companies who are not members. Initiation fee, \$50.00. Annual dues \$25.00. Dues payable annually.

**Explanation.**

This class is created only to permit desirable candidates to become members of the Traction Association, even though the company which employs them will not consent to join.

**Fourth:—Class “D”—Members.**

Being engineers or others who are interested in the Traction business or Traction engineering, who are not officers, employes or directors in companies engaged in the Traction business or any companies, firms or themselves, manufacturing or selling traction supplies or apparatus. Initiation fee, \$10.00. Annual Dues, \$5.00. Dues payable annually.

**Explanation.**

This class is intended to take in with discretion, engineer who can be of value to the Association work but are not directly benefited and also men who are financially or similarly interested in the traction business but not directly connected with it.

**Fifth:—Class “E”—Members.**

Professional Educators in Universities, Colleges and Schools, consisting of professors, instructors or teachers of engineering or kindred technical branches used in the traction industry and who are not officers or employes in traction companies or who are not interested in firms, companies or individuals supplying traction apparatus or equipment. To hold membership for one year only or until re-elected. Initiation fee, none. Annual dues, \$3.00. Dues payable annually.

**Explanation.**

This class is suggested by the belief that all industrial companies, professional educators and pupils would be greatly benefited by closer relations between the professional educator and the every day operator. Co-operation in Association work would bring about close contact between the educator and the operator, keeping the educator in constant touch and communication with operating progress. Such contact would be apt to break down prejudices against each class where it does exist. Many so-called "practical men" have a pronounced prejudice against the professional educator. His prejudice prompts a course of action diametrically opposed to practical common sense. This country contains an immense number of magnificently equipped laboratories and these laboratories, together with their director, apparatus and students could be directed along practical lines for the solution of real every day problems, to the great benefit of the industry so directing them and to the pupils.

Such a move would increase the efficiency of our engineering schools, render their courses more useful and produce graduate engineers of greater value to the industry.

Without "Carnegie's millions" we can by these means contribute much to the progress and usefulness of education. Millionaire philanthropists like Mr. Carnegie, to whom I figuratively "take off my hat," can feel that every dollar they donate to the cause of education will be enhanced in value by such a policy on the part of practical men.

It is intended that this membership can be held but for one year, or until re-elected. This is to provide that undesirable members shall be dropped without expulsion. As professional educators are generally poorly paid, no initiation fee is required, and the annual dues are placed at a figure just sufficient to cover actual expenses occasioned by these additional members.

**Sixth:—Class "F"—Associate Member Companies.**

Being companies, firms or individuals engaged in the manufacture or sale of traction apparatus, equipments or supplies, or otherwise commercially interested in traction properties other than by ownership of them. Initiation fee, \$25.00. Annual dues, \$20.00.

**Explanation.**

This class is intended to cover companies, firms or individuals collaterally interested in the traction industry, through sale

of apparatus, equipment or supplies. No particular logic underlies the suggested amount for initiation fee and annual dues. Perhaps these payments should be based on gross receipts, but such a suggestion hardly seems practical.

**Seventh:—Class "G"—Associate Members.**

Being officers or employes of Class "F" members.

Initiation fee, \$5.00. Annual dues, \$5.00. Dues payable annually.

**Explanation.**

This class is intended to admit salesmen and other officers and employes of companies selling apparatus and equipment to Traction Companies and to give them some identification with the Association and Traction interests. Many of these men are capable of contributing very materially to Association work and the Association is benefited by such members.

**Divisions of the Association.**

It is recognized that the industry is so complex in character that it is impossible to consider all matters of importance in one short annual session. It is also evident that all officers or employes of a company cannot be absent at one time, and yet there is practically no earnest worker in a traction company from the President down to the laborer, who would not be benefited by some Convention scheme or other plan that by increasing his knowledge or acquaintanceship with other men in the same line of work, his labor would be rendered more valuable to the company. For this and many other reasons too numerous to mention, I consider the following divisions of self-evident value:

**National Divisions.**

Upon application of 30 members of any and all classes who are engaged in the same line of work, National Divisions shall be created, allowed to organize and hold National Conventions in the following and other branches:

First: Traction Electrical Engineering.

Second: Accounting.

Third: Park and Amusement Superintendents.

Fourth: Transportation Superintendents.

Fifth: Traction Lawyers.

All members of these divisions shall be members of the American Traction Association.

**Explanation.**

It would be hard at this time to prognosticate the needs of division and this is intended to be an automatic scheme which provides for expansion of the Association and to keep the work under the control of the parent Association. Such divisions would not be created until the demand for their existence was apparent to 30 members. No company would be compelled to send delegates and yet those companies which believed they would receive benefits in excess of expenditures, could do so.

The entire traction industry would be benefited by the better development of the departments for which special sections were provided, and yet their work would in no way detract from the general interest in the main Convention of the American Traction Association, but would rather tend to enhance it as the main Convention could partake largely of the nature of a review of all special sections.

**Geographical Sections.**

State and Territorial sections shall be created upon application of five class "A" members, under such conditions as the Executive Committee may fix, but all participants shall be members of the American Traction Association.

**Explanation.**

A National Association, to be truly National, should hold its Conventions in various sections of the country. There may be some argument against this statement, but no matter where the general convention is held, the time and expenses of travel are always certain to prevent a good many companies remote from the point at which the Convention is held, from participating at all, or participating to the extent they would like to do.

The creation of the State and Territorial sections will permit more delegates to attend Conventions and secure the benefit of such attendance, and it seems unnecessary to argue affirmatively here, the advantage of such attendance.

It is also intended that such geographic sections shall take care of matters of purely local interest which the general Convention could not properly handle and would not have time to consider. Where possible, these geographical sections should be confined to one State, but in States of meagre population it would be necessary to combine several States to make up a territorial section sufficient to produce a well attended and interested Convention.

The creation of State and Territorial sections would also permit subordinate employes to attend these Conventions while the officers of the company would attend the National Association.

#### **Company Sections.**

Company sections composed of individuals who are officers and employes of member companies, shall be created upon application of any member company under such conditions as the Executive Committee shall fix. All participants, however, shall be members of the American Traction Association.

#### **Explanation.**

I think it will be generally admitted that the value of Association work depends upon the number of operators it reaches.

If Association work is beneficial, it should be carried down to the point where every ambitious employe can participate. In the gas and electric properties with which I am connected we have organized local clubs but as yet have no provision in our National bodies for affiliation. We know that such clubs tend to increase the efficiency of our operators and to increase the interest they take in their work. These "company sections" are merely provided for and are in no sense compulsory, but to the aggressive Manager who wants to avail himself of every opportunity of increasing the efficiency of his local staff, this is one means which is opened to him by proper planning on the part of the National Association and one which could be made of extreme benefit should company sections be organized to an extent which would warrant the exchange of work and encourage manufacturers to contribute to the proceedings of these company sections. It would also tend to enormously increase membership in the parent Association and many valuable workers would be recruited who otherwise would never find their way into the ranks of the parent Association.

These divisions and sections shall be allowed all initiation fees collected by them except on class "A" and class "E" members, and shall also be allowed such expenses as are authorized by the Executive Committee up to \$2.50 per annum for each member of such division or section until the aggregate expense of such divisions or sections shall equal 50 per cent. of the revenues of the American Traction Association, and thereafter this 50 per cent. shall be divided amongst these divisions and sections, pro rata upon the number of members in each.

**Special Work of the Association.**

The ideal Association would be one where each member was prosecuting some special work of value, for the common good of all. This ideal condition cannot be brought about. It would not only require that each member should be prosecuting some work of value but should be prosecuting work of most value, and that the results of such work should be made a matter of record available to all. In the suggestions which follow you will find that this point, however, has been kept in mind.

I understand that one feature that this Association expects to take care of and one that is not properly taken care of in any of the other Associations, is the creation of a proper information bureau.

In the days when the National Electric Light Association had a smaller number of members, and the members did not look for any particular support from the Association, it was very unusual to get a request for assistance. Today the number of requests which come in for assistance are very numerous, and some of them are very important. Take it in the case of a law-suit, on some point which has not been previously raised, a poor defense of that suit may result in the establishment of a precedent which may injure the value of all electric lighting properties, and the only litigation that has been carried on in the past year or two, has been carried on without the assistance of the National Electric Light Association, but the Association was informed of it, and individual members of the body were in touch with the litigants, and able to advise.

The question of Association is rather an interesting one. There is not an Association I know of which has proper revenue to do the work they should do, and yet some of the Associations have a very large income compared to others. All of the Gas Associations combined have not a revenue of \$15,000 a year. The American Institute of Electrical Engineers has a revenue of about \$30,000. The National Electric Light Association has a revenue of about \$20,000 a year, which is not adequate for that Association, and a great deal of work is done by outsiders without charge to the Association. There are some reasons why every one of these Associations must be more aggressive, and there are reasons why they should co-operate with other similar societies.

It is impossible for a single man or single group of men to determine what work is the most valuable to their members. Some broad and comprehensive scheme must be adopted to deter-

mine on what subject information is wanted. I have given this subject much thought and have solved this problem as best I know how by advocating to one Association the adoption of a "Question Box" on a comprehensive scale. I cannot express my views better than to quote from the preface of the first edition of this Question Box:

"The value of any association of this character must be measured by the services it can render its members. While attempting to advance our business methods it is surely not inconsistent to endeavor to advance our association methods. It is reasonable to suppose that members of this association will keenly appreciate that information which they most desire. Can any committee or officers of an association predetermine what will be the most prized by all of their members? I think not. Some expression must be obtained individually from the members. This can best be done by means of the Question Box. The idea is not a new one but I think the officers of this Association have put the Question Box on a higher plane and have elaborated its scope far beyond the comprehension of the original proposer's ideas. This plan, if carried to its logical conclusion, will make the annual conventions of this association an exchange market for ideas and a clearing house of knowledge.

"The benefits of co-operation increase faster than the arithmetical increase in the number of participants, and the greatest good will result from the greatest degree of co-operation."

"The future of the gas business—the very existence of our associations—depends upon the willingness of gas managers to give freely of their stock of knowledge."

"This Question Box department will often develop subjects which are entirely too broad to be properly considered as a portion of the Question Box, and where such subjects are uncovered I think it the duty of the editor of this department to recommend these subjects to the special consideration of the association."

Further advantages of the Question Box are indicated by the following quotations from the preface of the second volume of the Question Box:

"The fifth criticism, that the answers to questions should receive the stamp of approval of the association, I do not think is a proper one. I do not see that the association can stamp these answers with their approval, nor do I think that an assemblage of men would have any greater wisdom than these same

men have in their own offices. My own belief is that written discussion, which need only be offered after mature thought, is of greater value than impromptu discussion on the floor of a convention hall..

"The sixth criticism, that questions should be collected before the convention and answered on the floor, is absolutely impracticable. A mailing list of over sixteen hundred names has been used to collect the questions and answers published. How could this same information be obtained from say three hundred men assembled in a convention with their time limited and not many more than one hundred in the room at any one time?"

"The Question Box in its present form is not perfect and never will be, but it is hoped that improvement will continue. It, however, should cause every reader to do some serious thinking and should inspire study and investigation on the part of some. It offers a means of locating valuable engineering data and also bringing out talent not heretofore known or associated with any of the gas associations. It is bound to expose any popular errors and secure their correction, and will suggest material for association programs and investigation and research work. It offers an avenue for the information possessed by one to be made common to all, and matters of insufficient importance for the creation of a paper may find a suitable outlet through the Question Box. It offers an opportunity for every man in the gas business to offer some contribution for the good of the fraternity, and by giving an opportunity for the contributions to be prepared in advance, mature consideration and judgment can be applied. It should prove of value to every man having time for research and investigation work, to gas publications and to students, if for no other reasons than the many suggestions which it contains."

This movement has created almost universal interest and the growth of the idea is indicated by the following quotations from the preface of the third edition:

"The growth of support is best told by the following data:

Year.	Contributed		
	Questions.	Answers.	Contributors.
1903	173	685	83
1904	267	1060	150
1905	567	4920	519

The Question Box has heretofore been National in scope, but

it is this year International. Through the courtesy and co-operation of Mr. Walter King, of the Journal of Gas Lighting, London, England, a number of valuable and interesting answers have been secured from prominent members of the English Gas Fraternity.

The magnitude of this work is much larger than is generally supposed. The expenses of this year will amount to nearly four times the revenue of the Ohio Gas Light Association for the year 1904. Or stated in other words, the expenses if this publication will be approximately 50 per cent. of the aggregate revenues of all the Gas Associations in America. It will cost \$600 alone to mail the edition after it leaves the binder's hands.

In the office of the editor there have been 7,200 hours of work in gathering the questions, sending out the lists and getting the copy ready for the press. This would mean three years' steady work for one man working eight hours a day and three-hundred days per year. In addition to this work you must add the work of the postal department, the reader of the question list and the work of those contributing answers. The work of contributing answers would probably represent not less than 2,000 hours.

The 400,000 words contained in this publication have been read upon their receipt by the editor or his assistant, by a stenographer when copied, by a proof reader of the stenographer's work, again by the editor or his assistant before going to press, by the printer in setting up the type, by the printer's proof reader and by the editor's proof reader, seven readings in all (omitting duplicate readings due to errors, etc.) or the equivalent of reading 2,800,000 words.

For three months four stenographers have been busy copying answers, another stenographer on correspondence, three assistants to the editor, two clerks at all times, and occasionally ten clerks when a large batch of mail was sent out.

Seven thousand men were invited to contribute, 2,200 have signified their interest in the publication and 519 have contributed answers. If all who are interested or promised to contribute had done so the edition would have been printed in many volumes like the Encyclopaedia Britannica. The gas fraternity is composed of men of good intentions, but many of them do not realize the flight of time and their memories are treacherous.

The edition printed on light weight paper will consume 8,000 pounds. Requests for copies will come in from all sorts of people

and especially from engineers following other branches of work."

You will note that the last publication of this work had 519 contributors, or probably more people than have in the life of the gas business heretofore contributed to a single Association's proceedings.

From an economic standpoint the following quotation from the preface of the third edition, which refers to the work of the second edition, is interesting:

"Time at a convention costs money. Taking the last convention of the American Association at Washington, I will assume 300 delegates were in attendance at an average cost of \$100 each, or a total of \$30,000; deducting the time required for the election of officers, and reading reports, &c., &c., the working time of the convention did not exceed 10 hours or 600 minutes, making the cost of the convention \$50 a minute. There were 267 questions in the last Question Box, to which 1,052 answers were contributed by 150 contributors. We could not figure on less than 10 minutes to each question, requiring 267 times 10 = 2,670 minutes at a cost of \$50 per minute = \$133,500 against a cost of the last Question Box under present method of handling of about \$2,000."

It has been arranged that all information collected by means of the Question Box shall be put in the hands of competent revision committee and from it a very comprehensive and complete hand-book will be evolved. Information held by one man can in this way be made common to the entire fraternity and the field of research and experimental work can thus be reduced to that portion which is unknown to all.

It seems hardly necessary to dwell upon the advantages which can accrue from the inauguration of this work if interest can be aroused, general co-operation procured and the information obtained in this way properly used to form the basis of an encyclopedia or a hand-book.

The very method of collecting information automatically indexes it with some degree of accuracy and very much better than the indexing prevailing among most of our technical literature.

The question of the advancement of an industry or education of its followers depends not only upon information procurable, but upon the quick availability of this information.

**Progress.**

The National Electric Light Association and the Ohio Gas Light Association have a regular Editor of Progress, whose duty it is to watch all of the Trade Journals, Patent Office and other sources of information, and compile an annual report detailing progress made in the art. This department I believe to be of considerable value and certainly creates much interest.

**Wrinkle Department.**

Practically all of the Gas Associations and recently the National Electric Light Association have established what they term "a wrinkle department." It is hard to define just what constitutes a wrinkle. It is a patentable or unpatentable invention which may refer to a mechanical device or form of record, a method of making a joint or of extracting grease from waste. It generally refers to some quick method or simple apparatus for accomplishing results in a more economical or direct way. The National Electric Light Association has had this department in vogue for two years. The first year 102 wrinkles were contributed and the second year 118 wrinkles. One member of the National Electric Light Association told me he had been paying the annual dues for his company for nearly twenty years and the wrinkle department alone was worth the cost of association membership. I am inclined to think that your Association could afford to republish the last volume of wrinkles presented at the National Electric Light Association in Denver and send it to all of your members, simply as a suggestion as to how they can make this department valuable to your Association.

I could go on citing special work of value which might be done, but the above recommendations are intended more to suggest how immensely the benefits of Association work can be improved as a means of encouraging further suggestions, rather than an attempt to indicate how much should be done.

In planning your Association work it is well to keep in mind that a special wave of antagonism seems to be passing over the country against corporations, and this wave of antagonism is particularly directed against quasi-public corporations or those corporations operating under any special grant. A sensational press, platform and pulpit by constant reiteration has made the corporation appear as a curse rather than a blessing. The corporation is held up as the tool of the rich for the oppression of the poor, while the reverse is really true. In the superficial treatment of the press and platform, the theory which gave the corporation

birth is lost sight of. Some enterprises by their very nature, can only exist by the employment of immense amounts of capital. Ability to incorporate is simply a legal means for co-operation. If such co-operation was not provided for, the undertakings requiring considerable capital would be open only to the few men possessed of this required capital, and these enterprises would exceed the capital available in large amounts, and therefore the possessors of large amounts of capital could make these enterprises as productive as their greed might dictate. Legalized incorporation is simply a means for co-operation on the part of capital which enables the men of moderate or meagre means to join their interests and render their capital as productive as the man possessed of great wealth. Ability to incorporate is not essentially necessary to the rich but absolutely essential to others.

I once expressed similar views in a public address and a patriotic Englishman who heard my statements introduced himself to me and said with a tone of regret which I shall never forget, "Ah! If Briton only enjoyed the freedom of incorporation, our industrial condition would be vastly improved over what it now is."

Sooner or later, those who want to see the truth prevail rather than sensationalism, must take steps to give the voter the reasons why the ability of incorporation should be increased rather than lessened.

Industrial Associations for this reason should arrange provision for communication and co-operation with the associations of similar industries. The quasi-public corporation is apt to be hurt before other corporations are injured. A marked tendency towards more rigid control on the part of municipal and State authorities is evident. The State or City now assumes to prescribe our service, fix our rates and assess us for taxation. Owing to faulty tax laws, firms, individuals and corporations other than quasi-public corporations can escape their just burdens of taxation by securing through concealment or otherwise, low assessment values on their property, while the quasi-public corporation, if compelled to pay taxes and fixed rates on the same valuation, is bound to secure either inadequate rates or unjust taxation burdens. For this reason the quasi-public corporations must explore the resources of political economy to enforce and provide honest taxation of all property and I mention this simply as an example of one of many reasons why more intimate communication should exist between organizations such as the American Gas Light Association, the American Street Railway Association

and the National Electric Light Association. In addition to this, a closer association of all societies of a technical or semi-technical nature would prove immensely beneficial.

Location of all offices in the new Union building would be one step towards securing this desired affiliation.

Many of these problems I can simply outline but cannot offer a solution. I can, however, make recommendations based on many years' experience in Association work, that I hope will be given all the weight the delegates at this Convention can conscientiously give them.

**FIRST:** Listen to the recommendations of your active workers with a receptive mind.

**SECOND:** Do not forget the fact that improvements cannot be secured except by changes.

**THIRD:** Do not criticise unless you can see positive harm, and then sparingly, unless you can offer some better suggestion.

**FOURTH:** Do not oppose the man who is trying to do the work, but support him. Put a premium on interest in Association affairs and work in behalf of Association advancement.

**FIFTH:** Accept and act favorably upon the recommendations of workers aiming to secure organization upon higher and broader lines. If the plan suggested by them cannot be executed, delegate authority to either your officers or a special committee chosen by your officers to reorganize under some comprehensive plan which they may adopt and for the success of which they are willing to accept the responsibility. Give them full power to take all necessary steps, fix initiation fees, dues, accept new members, &c., and thus save waste of the most valuable thing required to secure progress, viz., time.

In concluding his paper, Mr. Doherty said, "If I can be of any service in the work that you are doing, I shall be glad to do it, and put you in touch with all of the men who have been working in the interest of better Association work for both the Gas and the National Electric Light Associations. In the Gas Association we have some very clever workers, and also in the Electric Light Association."

**President Ely:** I am sure we are much pleased with the remarks of Mr. Doherty, and much indebted to him for coming here. At the proper time a resolution expressive of our thanks will be adopted and spread upon the minutes. I desire to thank Mr. Doherty very much indeed for this kind expression concerning the future.

The matter of the New Constitution and By-Laws is now before us, and perhaps the best way to proceed with it is that the Secretary should read it over in its amended form, with some changes which were made in them at the conference held yesterday.

(Mr. Frank G. Jones in the chair.)

The Secretary proceeded with the reading of the Constitution and By-Laws, as amended at the Executive Committee meeting held on Tuesday, and the following discussion and further amendment occurred in connection therewith.

#### DISCUSSION ON CONSTITUTION AND BY-LAWS.

The changes in Section b of Article III and Article IV, of the Constitution were adopted without objection.

In connection with the by-laws the following action took place.

In connection with Article IV:

• Mr. H. A. Robinson, New York City: I move that the section relating to the Treasurer where it says that 'He shall give a bond to the president in such sum,' etc., shall be made to read that he shall be made to give a bond to the Association.

Mr. H. J. Davies, Cleveland: I think there was a reason, probably, for making that bond read to the president. Bonding companies are not permitted to, or at least they do not, issue bonds to Associations. They issue bonds to individuals or to corporations. This Association is not a corporation. In one instance, a case in which I was interested, we had to make the bond of an accounting officer read to another officer of the association, because the bonding company could not issue it to the association.

Treasurer Penington: My bond was made to the Association and handed to the president.

Mr. John A. Rigg, Reading: As I look at it, you cannot do it in any other way except to make the bond to the president.

Chairman Jones: There seems to be some question as to the right on the part of the guaranty companies to make a bond to the Association.

Mr. Robinson: My view is that it makes the president responsible for the money, and I don't think it is the intention to make the president responsible for the funds of the Association.

Mr. John I. Beggs: The president receives a bond for the faithful performance of the treasurer's duty. If the treasurer should default, the money would be paid by the surety company to the president, for account of the Association, he simply acting for the Association. The bond is made to him as president of the Association and the money would be paid to him by the surety or bonding company to make good any loss that might be incurred by the Association. I don't believe that a surety company would issue a bond to an unincorporated association. It must be issued to some individual who could collect it.

Mr. W. Worth Bean, St. Joseph, Mich.: I move we adopt the matter section by section, and when we come to the part which refers to the bond of the treasurer, the matter can be discussed, and an amendment made if desirable.

Mr. John A. Rigg: I move that the proposed form of by-laws, as amended by the Executive Committee be adopted as read, with the amendments thereto, which were passed upon by the Executive Committee.

(Neither of the above motions was seconded.)

Mr. John I. Beggs: There is one change I would like to suggest, in section 14, which, as it now reads, would make the section difficult of application. Section 14 reads in part, as follows: "Active members shall pay an admission fee of ten dollars, and annual dues payable in advance, based on gross earnings from railway operations during the preceding fiscal year (ending June 30th) etc." This would seem to imply that the fiscal year of all companies ended with the 30th

of June. That is so in the State of New York, made so by law, I believe, but I would like to change the last line of that sentence to read as follows: "Gross earnings from railway operation during the preceding fiscal year of the respective companies." Most companies throughout the United States have their fiscal year co-existent with the calendar year, and in all the companies I represent we will have a very great difficulty in making up our report to June 30th, and therefore I suggest we change the phraseology, and make it "During the preceding fiscal year of the respective companies."

Mr. W. Caryl Ely (on the floor): There was considerable discussion in drafting that section. The idea of putting the words "ending June 30th" in parenthesis was that the dues should be assessed upon earnings of corresponding periods in all companies. It does not necessarily mean the fiscal year of the company as fixed by law, or as fixed by the rules or regulations of the company, but the fiscal year defined by the rule here as ending June 30th.

Mr. Beggs: That matter escaped my notice, in the very exhaustive consideration we gave to this subject. I had it in mind to bring it up. It seems to me it would simplify our accounts to have it in the form which I suggested. Take, for instance, the Red Book and other statistical publications which report the earnings of these companies, you will always find the report made to cover the fiscal year of the company making the report. In every company with which I am connected, our fiscal year is co-existent with the calendar year. In nearly every company I am associated with, we have other interests beside the street railway—gas companies in some cases and electric light companies in other cases, and it would be some work to separate these earnings in the middle of the year when we are not making up our annual report.

Mr. Ely: Is it not done at the end of each six months?

Mr. Beggs: No, sir. At the end of each yearly period, so far as my knowledge goes, by most companies over the

country. We do it to a certain extent monthly, but not in the form in which it is presented to stockholders, in the various States which require the publication of the statistics. The phraseology which I offer would be applicable to the case of each company, no matter what time its fiscal year ended. In the case of the New York companies, which have to report in accordance with the requirements of the State Board of Railroad Commissioners, their year is made to end on June 30th.

Mr. Ely: The idea of putting in the words "June 30th." was to define the fiscal year for the assessment of dues in this organization, so that the dues would be assessed upon all companies for a like period.

Mr. Beggs: Then I should say, make it the end of the Association year. That is not June 30th. We go from one meeting to the next. The companies which have paid dues have paid them to this annual meeting. I was not aware there had been any discussion of that particular clause, but I certainly believe it would be better if we made it the fiscal year of the respective companies making the report. It does not make any difference in the result to the Association; we get the dues just the same, but it makes the matter easier for the companies that are members of the Association.

Mr. E. P. Shaw, Newburyport: The fiscal year in Massachusetts ends September 30th.

Mr. John A. Rigg: I represent several companies in Pennsylvania, which make reports at the end of the calendar year, and I second Mr. Beggs' motion.

Mr. Ely: It is manifest that it cannot be September 30th, and December 31st and June 30th. Let me say to you as to what lies before you, unless you have material objections to make, if you want to adopt it, I suggest you adopt it as it stands. The minute you start in to discuss it, you will find that you are adrift on a broad sea. Here is a book of 175 pages (exhibiting book) embodying a careful study by Professor H. H. Norris of Cornell University, of all similar organ-

izations in this country, and containing a definite and analytical study of fourteen of the leading associations. That is what I meant when I said that there has been careful consideration given to these questions, and it develops in a moment if we are not at liberty to fix some fiscal year for the assessment of dues in the Association upon earnings, we are adrift.

Mr. E. G. Connette, Syracuse: I do not want to make any suggestions which will interfere with the work which has been so carefully considered by the Executive Committee, but my connection with the New York State Railway Association has convinced me that this plan for assessing companies for their annual dues has in some respects been inequitable. For instance as an illustration, a company whose gross annual receipts are \$249,000 will pay an assessment of fifty dollars, while another company whose gross annual receipts were \$251,000 would have paid seventy-five dollars. I have suggested to the Executive Committee of the Street Railway Association of the State of New York that this ought to be changed. I suggest whether it would not be well to make the basis of the annual dues a percentage of the gross income, making the minimum fifteen dollars, and the maximum six hundred dollars. This plan would not work any hardship, and is not inequitable. I merely offer this as a suggestion. I know the Executive Committee has carefully considered this, but from my experience, a scale of dues arranged in this way, works inequitably and has caused some of the smaller companies in the State of New York to drop their membership in the State Association. If the scale was fixed on a percentage basis of the gross income of the company, so that the minimum annual dues would be \$15 and the maximum annual dues \$600, that inequality would be eliminated.

Mr. H. H. Vreeland, New York: I think this is all out of order. There is a motion made by Mr. Robinson, regularly seconded, before the house, which was not voted on or withdrawn.

Chairman Jones: Mr. Rigg made a motion; will he repeat the motion?

Mr. Rigg: My motion is that the report of the Executive Committee embodying the proposed Constitution and By-Laws, as amended, be adopted, as read by the secretary, including the amendment of Mr. Beggs, to insert the words "of the respective companies" in place of the words "ending June 30th."

Mr. F. E. Smith, Chicago: I offer an amendment that the maximum dues be \$250 (no second to this motion.)

Chairman Jones: It is moved and seconded that the proposed Constitution and By-Laws of the American Street and Interurban Railway Association be adopted as read, with the amendment of Mr. Beggs. All in favor,—

Mr. C. S. Sergeant, Boston: I don't want to put a spoke in this machine, but I am afflicted with one doubt. I ask whether there is time to consider one point. It is provided in Article II that "vice-presidents equal in number to the number of affiliated associations" shall be elected at the annual meeting, and it is provided in Article VI. that the Executive Committee shall "consist of the president, the vice-presidents and one member appointed by each of the affiliated associations," and then it is provided that the Executive Committee may admit affiliated associations, and I understand that to be new associations. Now, my question is, at what time can they be admitted? If they can only be admitted at the annual meeting, I see no trouble, but if they are to be admitted at any time, how are the vice-presidents to correspond to the number of affiliated associations?

Chairman Jones: As I understand, they can only be admitted at the annual meeting. That was the intention,—that the new associations should come in at the annual meeting.

Mr. Beggs: It can be done by the Association only, and the Association can only do it at the annual meeting. That point was discussed.

Mr. Sergeant: That answers my question.

Mr. H. H. Vreeland, New York: It has been very evident to every member that the results which the Association was organized to attain, were not reached, nor were the methods employed sufficiently advanced to be called satisfactory. The great changes which have been brought about by the leasing and consolidation of the various properties which were represented in the original membership, have been powerful factors in the change. The Association in its primitive state had to consider and deal with momentous questions which related to horse cars and their operation, but the rapid evolution of the past ten years has made noticeable the limitations which then existed and broadened and expanded the methods to their present efficiency. Not so, however, with the methods of this Association, which have continued to be as originally instituted.

The meeting of the Association in New York in 1901 recognized the impossibility of the continuance of the Association on the existing basis and changed the plan of holding its meetings so that the managers of properties in cities in which the meetings were to be held, would not be obliged to assume substantially the entire expense of entertaining the members.

A movement was then inaugurated for the organization of a Manufacturers' Association to be a companion of this body in its improvement of street railway interests. It was to be organized on lines quite similar to such associations as have existed for many years in connection with steam railroad interests, for the purpose of displaying the exhibits to the best advantage of all interested, for managing the entertainment features and other connected detail, and affording the Executive Committee the opportunity of selecting, independently, the place of next meeting. Nothing occurred until next meeting but much discussion was had by those who felt that something was slipping away from them.

The doubt of the ability of the Association to continue, if

any one but a street railroad manager carried the burden of the exhibition, seemed to be the key note of hesitancy. Fortunately, better judgment prevailed and the members have today an associated organization, that of the Manufacturers, which has given us an exhibit such as we have never had before in the life of the Association, without expense or burden to the railway management of this city. It has also been demonstrated that the Association stands as independently as it should and is enabled to select any city in the United States for its convention without imposing upon the financial ability or interfering with the daily business of any local manager or company.

An enlargement of the scope of the Association necessarily brings changes in its methods. It has been evident to every one who has had particular relation with the Association for any number of years, that if they were only paying \$25 a year in dues, they were not getting \$25 in value out of the connection. It seemed in the judgment of many of those who had to do with the management that it was run on too limited lines and that, if its life was to continue in existence, new plans and methods must be adopted and vigorously carried out.

The matter of reorganization and extension has been carefully considered for the past two or three years. Every one has had an opportunity to discuss and consider it. The plan adopted by the Executive Committee and Special Committee on the Constitution has been already before the members of the Association for many months. Today at this meeting again they have heard what are the views of the Special and Executive Committees, and received other information, as to how the Association should be best run to produce the most desirable results.

We all know that changes cannot be made in a day. For five or six years the steam railroads experimented with the introduction of steel tired wheels, but after that experiment, their use became a settled and fixed one in steam railroad life.

On the other hand, some of the members of the Association have been experimenting for five or six years to determine this question from their point of view, which was satisfactorily determined from the steam railroads' standpoint fifteen years ago.

Many questions which are disposed of by steam railroad practice are now the subject of discussion due to the failure to properly disseminate among the members the very valuable information which has been collected in other lines of work during the past fifteen or twenty years.

As I stated before, every question now discussed before this Association is entirely different from those which were presented at the meeting of fifteen years ago, but, on the other hand, many questions are considered here today which have been disposed of in other circles long in the past.

The plan and purpose here is identical with the organization of the American Railway Association, a steam railroad body with which I have had to do for a number of years and its affiliated associations, and which have produced the very best results.

Questions have been taken up by the American Railway Association and decided for the whole country, and thereby saving the time and effort of men, one in the eastern section of the country who was groping about with one end of the proposition, while another was taking up the same question on the Pacific Coast. I may instance the question of establishing a uniform standard of time for the United States for the operation of steam railroads which was considered and finally settled. A uniform system of rules and regulations for the operation of trains and telegraphic orders was established, so that an engineer may run a train in Maine one month and go to California the next month, or to any other State where there was railroad operation and find the rules to be the same as those which bound him in the State of Maine.

The business of this Association should be conducted in

such a manner as to be of the greatest value to the members. I have frequently protested to the President of the Association and to others, that the work of furnishing, through departments of any company, data and information week in and week out to companies throughout the United States was too laborious to be continued. While as a matter of friendship we are desirous of assisting all members, it takes a great deal of the time of the heads of departments of my company, and more than they should be called upon to contribute. Such information should be furnished from the chief office of this Association, which should maintain a headquarters under intelligent supervision and where time and care is given to matters technical and practical that may prove of value to the operating street railroad man of the country.

We are now standing at the turning of the ways, and there must be a change if we want the Association to go on. It cannot go on as at present conducted.

It is a question with many men who manage large properties whether they can afford to leave their important business affairs and take time to attend the meetings as they are now conducted. I say this in frankness and without intention of making any reflection on any one. I have been a President of the Association as well as a member of the Executive Committee, and if my remarks reflect on any one, they conspicuously reflect upon myself.

In mapping out the scheme of proposed reorganization, and the method of conducting the business of the Association, the President has been ably assisted by Professor H. H. Norris, who has prepared analytical tables as to methods, plans, objects and scope of railway associations. I have looked over the book carefully, and from my point of view as President of a large steam railroad association and as a member of the Executive Committee of many other organizations, I must say that it is the most thorough piece of work I have ever seen. The Executive Committee has had the benefit of the very patient

and long continued study and excellent judgment of an expert like Professor Norris, and you have now before you the best results of the Committee's work, which I trust, shall raise the work of the Association to a higher and better plane, and keep pace with the development of the industry. Without the reformation suggested by the Committee's work, the Association will either stand still or speedily die.

Mr. Ely: If I may be pardoned, just a word. Sometimes an erroneous impression prevails concerning the thought that underlies such a work as this. Now we (those of us who have been laboring on this matter, the present Executive Committee, the past Executive Committee, and others), want to disclaim any idea of doing some academic or theoretical thing. We want, and what we have desired to get, is something that is intensely practical. We have been moved largely by monetary considerations. This is a commercial purpose. The question is—what are we going to get by it; what is it going to cost, and where the money is coming from with which to defray the expense, are three hard business propositions that have exercised the minds of all of us. When you take the Executive Committees of the past two or three years, to which Mr. Vreeland refers, and examine the personnel of the committees, *ad seriatim*, if you please, you will not find much sentiment on the committees. It is all pretty hard business.

To the schedule of dues which has been proposed, a great deal of time has been devoted, and the question of the number of companies, of the different classes, and what they would pay, the benefits derived by the companies paying the different rates, these things have been very carefully weighed. The larger companies, it should be remembered, are the ones that can get along the best without such an association as this. Mr. Vreeland, Mr. Sergeant, Mr. Parsons, Mr. Hedley, Mr. Beggs, who represent the larger companies of the Association, have sufficient revenue to enable them to hire experts to determine every question that perplexes their minds, but

the small companies cannot afford to do that. Many of the smaller companies have imposed in the past upon the good nature of the large companies. Now, the large companies cannot stand that any longer. The burden involved is too great. A gentleman who has a great system, and whose name I shall not mention, wrote me regarding this matter the other day. His system of railways is very successful; it is high up in the practice of the art of electric railway operation. He wrote me that he could well afford to pay the Association, in addition to the dues of the company, a thousand dollars a year if the Association maintained a proper bureau to give out the information that was asked from his company, and it would be money saved to this corporation. I refer to Mr. Goodrich of Minneapolis. He said he always tried to give the information that was asked for, and to give careful thought and study to the preparation of it, but he said the heads of his departments are very busy men, and although he turns these requests over to them, coupled with instructions that they receive careful investigation and reply, he knew that much that went out in answer to these questions and requests for information did not satisfy him. Mr. Vreeland has several times at our meetings referred to the fact that his company is being asked constantly for information of this kind. You will therefore see that it is not the larger companies which will be benefited most by these new plans, but the smaller companies. Go half way down the list of membership fees, to the companies with gross receipts from \$50,000 to \$250,000, \$500,000, \$1,000,000 and \$2,000,000. These are the companies that have problems of sufficient importance to them to require as thorough expert investigation as those which confront the \$10,000,000 companies, but while they have the demand for the data, they have not the revenues of the big companies to make the special investigations. Therefore, the companies in the middle of the list will be more benefited than the large companies, and it resolves itself, in this kind of co-operation,

to the point it always does, that where you get men enlisted together to work co-operatively for the mutual good, those with the largest resources contribute the most; those who could best get along without such co-operative work, join in the work for the benefit of others. It seems to me if you carefully examine the list of fees, you will find it well-balanced, and well-adjusted.

Chairman Jones: The vote is now on the motion of Mr. Rigg to adopt the Constitution and By-Laws with the changes reported by the Executive Committee, which were made at the meeting of the Committee yesterday, including the amendment made by Mr. Beggs regarding the change in Article XIV of the by-laws.

Mr. C. O. Mailloux, New York City: There was a previous motion to change the word "president" in Article IV of the by-laws to "association."

Chairman Jones: There was a motion to that effect, but the chair understood that the article would remain as it is.

Mr. Mailloux: It cannot remain unless the gentleman who made the motion, withdraws it.

Mr. Robinson: I withdraw the motion.

Mr. Beggs: I suggest a standing vote.

Chairman Jones then put the motion, which was carried, Mr. F. E. Smith, of Chicago, being the only member to vote in the negative.

Chairman Jones: I take great pleasure in announcing the motion as passed, adopting the Constitution and By-Laws of the American Street and Interurban Railway Association.

Mr. C. O. Mailloux: I would ask for information—when does the new Constitution go into effect?

Chairman Jones: As I understand it, the new Constitution goes into effect immediately after the choice of the new officers.

Mr. F. E. Smith: Who are the members of this new Association, and who are going to elect the officers?

Chairman Jones: As we understand it, the members of the old Association are members of the new Association.

Mr. Smith: It does not say so.

Mr. Beggs: The members who have adopted this Constitution and By-Laws are the members of the Association until they cease to be members under the limitations of the By-Laws.

Mr. Smith: Would they not have to sign the Constitution and By-Laws?

Mr. Beggs: We do not need a declaration to that effect.

(The Constitution and By-Laws, as finally adopted, will be found at the end of the Report.)

Secretary Penington announced that the Engineers' Club and the Manufacturers' Club of the city tendered to the officers and members of the Association the privilege of their respective club-houses during the week.

#### APPOINTMENT OF COMMITTEE ON NOMINATIONS.

Chairman Jones: The next business will be the appointment of a nominating committee to nominate officers for the ensuing year. The Chair appoints the following named gentlemen: Messrs. John B. Parsons, of Philadelphia; H. H. Vreeland, of New York City; C. S. Sergeant, of Boston; Theodore Stebbins, of Columbus, Ohio; and Walter P. Read, of Salt Lake City.

#### APPOINTMENT OF COMMITTEE ON RESOLUTIONS.

Chairman Jones: The following named gentlemen will be appointed as a committee on resolutions of thanks; Messrs. C. Loomis Allen, of Utica, N. Y.; John A. Rigg, of Reading, Pa.; and W. A. Smith, of Omaha, Neb.

#### MR. DAVIES ON FIRE INSURANCE.

Mr. Henry J. Davies: Mr. Chairman, in line with the suggestion in the admirable address of the president, and with

the recommendation of the Executive Committee, I wish to move the appointment by the president of a standing committee of five on Insurance and Fire-Protection, the duties of which committee shall be to gather statistical information and to study the subjects of fire insurance, and, more particularly, the protection of street railway properties against loss by fire and the consequent loss to business. The more important part of the duties of the committee will be the subject of better construction of power-houses and their better protection against loss or damage by fire, for the loss to the business of a company consequent upon a fire is much greater than the amount that is likely to be collected from any insurance company after a fire. Properly protected car-houses can be insured at a much lower rate than unprotected buildings such as are most of the car-houses today. Reduction in rates will follow naturally the better protection of car houses. Rates on car-houses even as car-houses are constructed now, are too high. Reports from more than 400 street railway companies of amounts paid by them for fire insurance in the past ten years, and the amount of losses sustained, indicate that the losses have been less than one-third of the amounts paid for insurance, so that there has been great profit to the insurance companies in the insurance of railway properties. This committee can verify these figures and gather other information which will be of benefit to every member of the association, and there will be presented to it plans for the insurance by street railway companies themselves of their own property, at actual cost.

Chairman Jones put the question on the motion which was unanimously carried.

The meeting then adjourned until ten o'clock Thursday morning.

#### *THURSDAY MORNING SESSION.*

Vice-President Beggs called the meeting to order at 11 o'clock.

Vice-President Beggs: President Ely is detained this morning on other business in connection with the affairs of the Association and has requested that I open the meeting.

The first order of business is the reading of a paper on "Notes on the Design of Large Gas Engines with Special Reference to Railway Work" by Arthur West. I am deeply interested in this subject of gas-engines for producing power in large power-plants. As Mr. West is unavoidably absent, I will ask Mr. Bibbins to step to the front, and proceed with the paper.

Mr. Bibbins then presented the paper as follows:

NOTES ON THE DESIGN OF LARGE GAS ENGINES WITH  
SPECIAL REFERENCE TO RAILWAY WORK.

To the American Street Railway Association—

Gentlemen:

The following remarks, as the title indicates, are applicable to large size gas engines only. The smaller sizes are unsuited to important electric railway installations on account of first cost, multiplicity of parts and greater expense for attendance, etc. The tendency of the modern plant is constantly in the direction of large size units. This is indicated in the rapid increase in the size of steam turbines installed in modern stations. Similar reasons will, it is believed, cause a demand for large size gas engines for electric railway work in conjunction with producers to operate them.

One of the most important considerations in the design of large gas engines is the arrangement of the cylinders. In a single cylinder single acting four cycle engine an explosion takes place once in every two revolutions. In order, therefore, to get the same rotative effect as with a double acting steam cylinder, it is necessary to work four single acting cylinders on the shaft or two double acting gas cylinders tandem on one crank pin. With this arrangement four explosions are obtained in two revolutions, or an explosion every  $180^\circ$  of crank angle. In case of a misfire or premature ignition due to bad gas, the crank can only move one-half a turn before another explosion takes place. In a single cylinder single acting engine the crank must move two whole turns before the next explosion, while with two single acting cylinders opposed to each other or one double acting cylinder the crank

may be required to move one and one-half times before the next explosion. The relative evil effects of a premature ignition or misfire are, therefore, in the following ratios:

Two double acting cylinders.....	1
Two single acting cylinders, opposed type.....	3
One double acting cylinder.....	3
One single acting cylinder.....	4

Gas engines and producers to be commercially successful must be designed to be run with the same class of help as is employed on Corliss engines and boilers. This being the case, misfire and prematures are liable to occur occasionally, and the designer must minimize their possibilities for evil. These considerations, as well as the capacity for caring for heavily swinging railway loads, have caused our adoption of tandem double acting cylinders for railway work.

It is sometimes argued that cylinders so arranged are inaccessible. If, as is the practice of the Westinghouse Company, ample space is arranged between the cylinders, and if the inlet and exhaust valves are not located in the heads, but in the cylinder body and entirely above the floor level, such a gas engine is as accessible as a tandem compound Corliss engine or as a Corliss engine driving an air compressor.

The speed of a gas engine must be adapted to the kind of generator to which it is to be directly connected. In a general way, its speed will usually somewhat exceed that of a Corliss engine of the same cylinder dimensions. In my experience, the speed of large steam engines is limited by the inertia and consequent wear and tear of the valve gear rather than by the inertia of the reciprocating parts themselves, which is absorbed by the compression. Inasmuch as in a four cycle gas engine the valve gear only moves at half the speed of the engine, somewhat higher speeds are permissible than would be the case with a steam engine having the same dimensions of cylinders.

The speed regulation adopted for large Westinghouse gas engines is especially suitable for generator driving in that no conditions of changeable load or variable friction of valve gear affect the regulator. Our gas engine regulator governs the speed by means of a relay cylinder, and, therefore, produces results similar in type to those obtained with the relay governor used by the Westinghouse Machine Company on steam turbines. The advantage of such a relay governor with the gas engine is that the varying friction of valves with different qualities of gas does not affect the sensitiveness of the governor. Without a relay

cylinder the only way in which the result can be accomplished on large gas engines is by some form of a drop cut-off controlling the gas. This is objectionable on a gas engine, as any slight change in the speed of the dash pot very seriously affects the mixture of gas and air, with corresponding bad effect upon the regulation. Such small changes in speed of dash pots are frequent in a Corliss engine, where they cause no bad results. The Westinghouse arrangement employs no releasing gear of any kind, but secures all the advantages of regulation without its use.

The question is frequently asked as to whether large gas engines will drive A. C. generators successfully in electrical synchronism or "parallel." This has been done for several years past in Germany with entire success, and it has also been done in a number of instances very successfully by our company. We have at the present time orders for several such plants on our books, one of which is to operate an electric railway from Warren, Pa., to Jamestown, N. Y., which we expect will be in operation some time during the autumn.

It is sufficient for our purpose to observe here that the cyclic variation, i. e., the degree of departure from absolutely uniform rotation, is sufficiently small to conform with the design of generators now built for steam driving.

The European designer of gas engines has allowed himself an amount of complication in valve gear which would not be permissible under American operating conditions. The successful American machine must be as nearly "Fool Proof" as is the large Corliss engine. If it is not, it will fail to be a success from the purchaser's point of view—no matter what thermal efficiency may be claimed by the builders—as a consequence of such complications as the European engineers have been prone to adopt. In the designing of valve gear for large gas engines, wide range of quality of gases must be considered. In this respect the design of the gas engine is very different from that of a steam engine, inasmuch as the steam used has practically constant characteristics, differing only in such minor points as pressure and superheat. With the different kinds of gas to be met with, however, the proportions of air and gas, and sometimes of compression, are radically different, and no gear can hope to be a universal success which does not provide for meeting the widely varying condition to be encountered in the market.

We are frequently asked, "What is the overload capacity of your gas engine?" A clear understanding on the part of the purchaser of the limitations in this direction is very desirable.

from the point of view both of the buyer and seller. A gas engine and producer is thermally very much more efficient than a steam engine and boiler. It is, perhaps, not amiss to say that, with a well designed producer and gas engine plant, a horse power can be delivered with one-half the cost of fuel that is possible with a well designed steam engine plant. The power of the gas engine, however, is limited by the total volume of explosive mixture which can be drawn into the cylinders during the suction stroke, compressed and finally ignited. This condition sets a limit which does not allow of a large temporary increase of the power, such as obtained with the Westinghouse steam turbine by the automatic operation of the secondary admission valve. Such overload capacity is, of course, convenient for the purchaser, but it is unobtainable on a gas engine, unless the engine is largely under-rated, and the purchaser should consider that this is one of the prices that he pays for the enormously increased output obtained with the gas engine per pound of coal. The overload capacity is, therefore, simply the amount which the builder rates his machine below its ultimate capacity. It has been our practice to rate our gas engines in such a way that they would have a safe overload capacity of ten percent. Our machines are ordinarily good for somewhat more than this, but conservative engineering requires that there be a margin of power in order that overloads may not materially reduce the speed. The above remarks on overload furnish a general guide which may be of service in selecting suitable generator capacity for a gas engine. For ordinary cases the overload capacity of the generator and that of the gas engine should be about equal, although the gas engine will indefinitely carry its overload while the generator will not, in all cases, unless it is bought with that understanding.

The mechanical efficiency of a large gas engine is very much greater with a four stroke cycle than with a two stroke cycle, this being one of the arguments against the two cycle engine. It is no uncommon thing to see two cycle engines which do not realize as brake horse power more than sixty percent. of the work actually done by the combustion in the cylinders. The efficiency of a four cycle engine varies considerably, but it may be said in a general way that a well designed engine will deliver about eighty-five percent. of the gas indicated horse power in the form of brake horse power. This fifteen percent. of power lost in not exclusively composed of frictional resistance of journals, crosshead slides, etc., as is the case in a steam engine. The four cycle engine has, of course, to draw in its own mixture of air

and gas and compress the same, and its functions, therefore, combine those of a pump, a compressor and a motor. It is the pumping and compressing work which causes the mechanical efficiency of the gas engine to be somewhat lower than that of a steam engine. The actual friction of the working parts need be no greater than with a well constructed Corliss engine, viz., 90-95 per cent. In order to keep down the friction and increase the reliability of the machines, it is the practice of the Westinghouse Machine Company to design large gas engines with provisions for attaching a continuous return oiling system. The large amount of oil put through the journals increases the safety, requires less attendance and keying up, and washes out dust if the engine is required to operate in an atmosphere which is not clean.

The thermodynamic efficiency of the gas engine varies so much with different kinds of gas that it is hard to say just what the average value would be. It is probably not far from the truth, however, that its efficiency is about twenty-five percent, though in favorable cases gas engines have obtained efficiencies\* well over thirty per cent.

There is an impression rather prevalent that a gas engine is uncertain and hard to start. A properly designed engine, supplied with fairly decent gas, can be started as easily as a steam engine. Large Westinghouse horizontal gas engines are started by means of compressed air, the only operations required being, (1) open the main gas valve; (2) close the igniter circuit; (3) open one compressed air valve, similar in construction to an engine throttle. The compressed air puts the engine in motion, which draws the charge into the cylinders and compresses the same, after which the first explosion takes place. Air is shut off and the engine is in full operation. We find no more difficulty in starting our gas engines than a steam engine of comparative size. I desire to lay stress on this point, as one of the stock arguments against the gas engine is that it is difficult to get into operation.

With certain kinds of gas, inspection of the interior parts of the cylinders is often desirable at regular intervals of, say, a couple of months. This is especially the case with blast furnace gas, and also with producer gas made from certain kinds of fuel. We have taken particular pains to arrange our cylinders so that no parts of the valve gear or valves are below the

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\* Efficiency = 
$$\frac{\text{Heat equivalent of work done.}}{\text{Heat Input}}$$

Fig. 1.

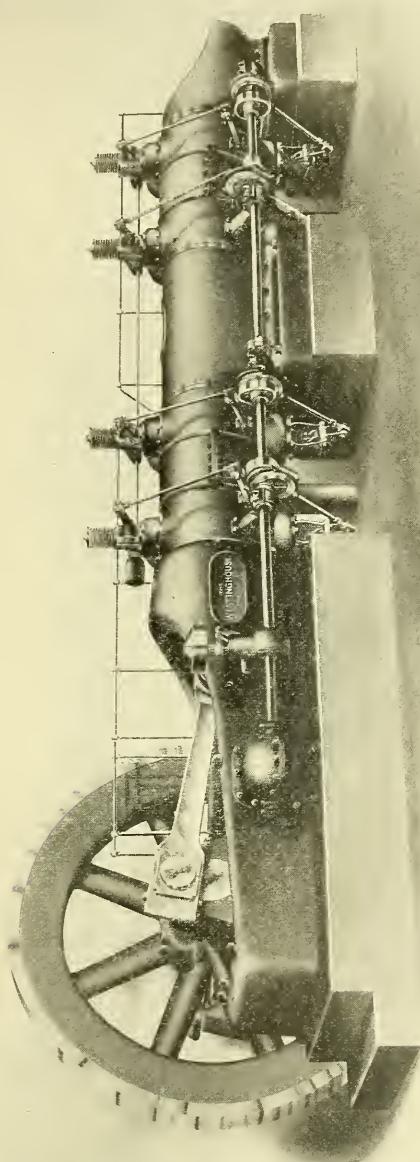
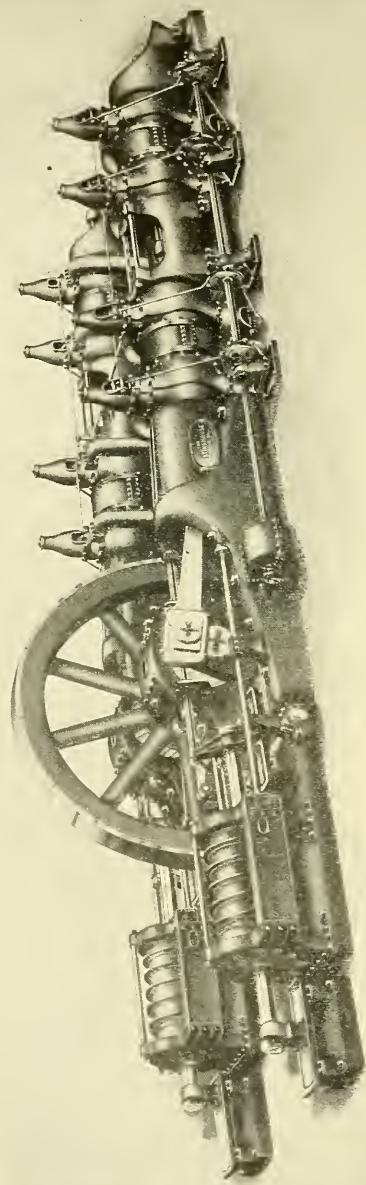


Fig. 2.



floor. The inlet valves being located directly on the top of the cylinder, easy access can be had to either end of either cylinder by removing the inlet bonnets. The exhaust valves are also a part of the engine which need occasional attention for regrinding. Especial care has been taken to render these quite easily removable. The cylinders are, therefore, directly accessible from the top through the inlet openings and from the bottom through the exhaust openings. The fact that all the valve parts are entirely above the floor line renders these operations much easier than if a large part of the valve gear extended downward into foundation parts. It is not necessary to remove the cylinder heads, except to examine the piston rings themselves, which is not often required. Inasmuch as clean gas cannot always be secured, the importance of such easy entrance to the gas cylinders cannot be overestimated.

The general type of engine commented on above is shown in the two accompanying photographs. The first (Fig. 1.) shows the type of two engines being built by the Westinghouse Machine Company for the Union Traction Company of Kansas, Independence, Kansas, one being of 500 brake horse power and one of 1,000 brake horse power. The second photograph (Fig. 2) shows one of two twin tandem furnace gas blowing engines now under construction for the Edgar Thomson plant of the Carnegie Steel Company. For electric railway work, no change would be made except to omit the blowing tubs. As electric units these engines would have a maximum capacity of about 3,500 horse power each, or 2,000 K. W.

The large size gas engine has come to fill such an important place in Europe, and has there proven itself to be so reliable and serviceable, that there is no question about its being adopted in this country in the near future, in a form suited to American operating conditions.

It is hoped that these general observations will be found of interest to intending users of gas power in large quantities.

Respectfully submitted,

ARTHUR WEST.

Vice-President Beggs: Gentlemen, you have heard the paper by Mr. Arthur West, on the subject of Gas Engines, read by Mr. Bibbins. I sincerely trust that it will provoke some inquiries, at least, if not very extended discussion. The gas engine is probably not very well known. I am one of

those who have great hopes of great economies being brought about in the production of power through producer gas-engines. Therefore, such papers as that just presented are extremely interesting to me. Some of you know that three or four years ago I stated at a meeting that we would be able to reduce the cost of power at least one-half by the use of gas-engines. I therefore trust the members will feel free to ask any questions of Mr. Bibbins. There is another paper dealing with the same subject which may provoke more discussion than the paper of Mr. West. The paper is now open for discussion by the members. My own experience is that these papers, while valuable in the manner in which they are prepared, lose a large part of their value if they do not provoke inquiry and discussion which bring out more forcibly the merit of the papers; in other words, the paper should be a text from which to draw out the merits of the various points.

Mr. C. O. Mailloux: I think it would be a good idea to have the second paper read, and have them discussed together, because I really think there is more room for discussion on the second paper than on the first. Furthermore, I think Mr. Bibbins is the most competent person present to discuss the papers.

Vice-President Beggs: We will ask Mr. Bibbins to read his paper on "The Application of Gas Power to Electric Railway Service." Mr. Bibbins then presented the paper as follows:

THE APPLICATION OF GAS POWER TO ELECTRIC  
RAILWAY SERVICE.

To the American Street Railway Association.

Gentlemen:—

In bringing this subject before you, we do so with the conviction that the problem of ultimate adoption of gas power is a present and serious one. You may not be in accord with our present optimism. In fact, on few subjects does engineering and commercial opinion exhibit greater conservatism (possibly due to lack of direct experience with gas power or to the influence of

adverse reports from small and inadequately equipped plants). Yet, we feel that the practical difficulties incident to the development of such an important power system have now been so far overcome as to warrant the fullest optimism. We have but to look abroad for complete vindication.

Primarily, our objective is to place before you, as fully as possible, results that have already been attained, leaving to your own judgment the soundness of our opinions upon the topics discussed in this paper.

#### **Characteristics of Street Railway Service.**

In a paper read last year before your association we considered steam turbines, in their special application to railroad work. Three important characteristics for a prime mover were mentioned, viz., close speed regulation, considerable overload capacity and high economy over normal ranges of load. Although these qualifications are, indeed, most desirable, entire success may only be attained through the harmonious working of the entire plant, whether steam or gas; in fact, in the case of the latter, successful operation may be attributed in almost equal proportions to the gas and power generating sections of the plant. Unfortunately, it is true that the faults of the one may all too readily be charged to the other; yet a careful study of practical operation shows the futility of such distribution of responsibility.

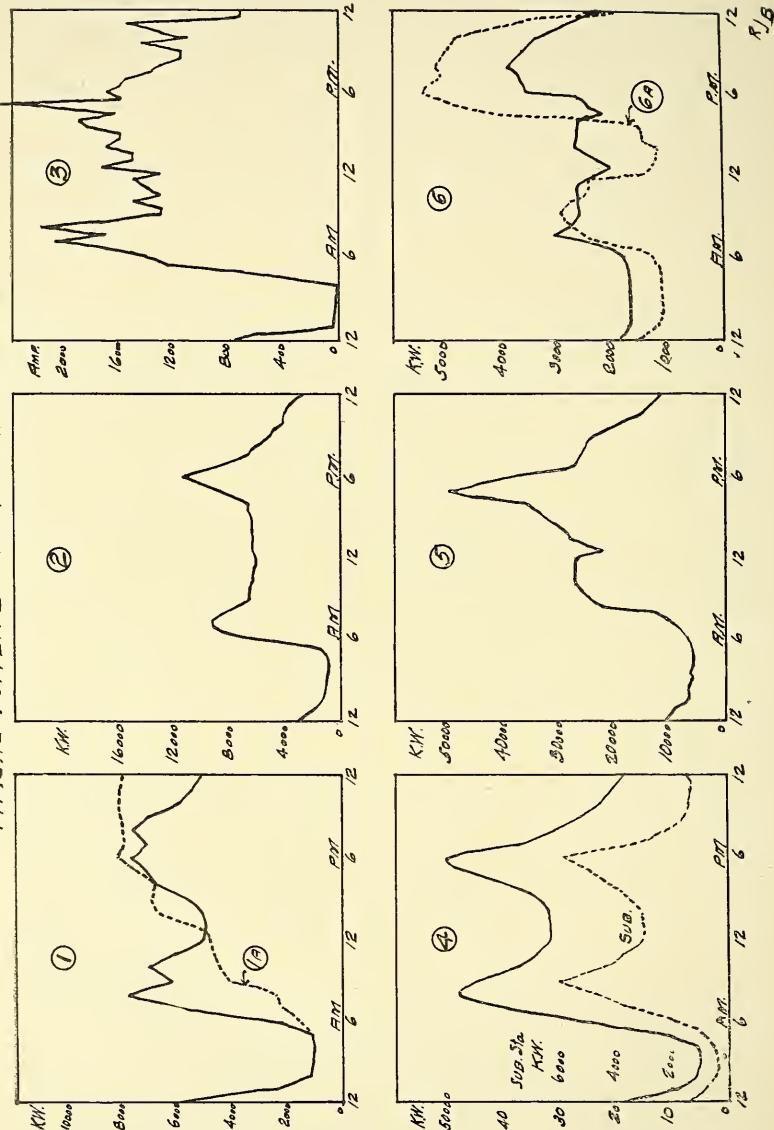
A perspective view of railway service, as distinguished from electric lighting service, may be had by examining the daily load curves from typical power stations. See Figs. 1 to 7 and Table 1 (Appendix).

From the data presented it is obvious that, as a whole, a generating plant for railway service, especially for suburban and heavy duty work, must be unusually responsive to sudden power demands; to accomplish this the two sections of the plant must be peculiarly fitted to operate together under normal load conditions. The plant should also be quick in starting, capable of standby for long periods without excessive loss of heat and, above all, should show high all day fuel economy. This is admittedly a formidable list of requirements; yet we may not dodge the issue with gas power any more than with steam.

#### **Adaptability of Gas Engine and Producer Plant.**

Does gas power fulfill in every respect the conditions imposed? As the old and much abused saying goes, "The proof of the pudding lies in the eating thereof." This phase of the subject

## TYPICAL POWER STATION LOAD CURVES



Figs. 1 to 6.

may be best approached through comparison, step by step, with steam power with which every one is familiar. This is done not for the purpose of discrediting the latter, but merely to obtain a clearer conception of the points involved.

### The Gas Engine.

Primarily, the fitness of the gas engine for driving electrical machinery must be demonstrated beyond question. This has repeatedly occurred in practice, examples of which will be later cited. The paper by Mr. West has already treated important points in detail. He has observed that with certain cylinder arrangements rotative speeds, uniformity of turning moment and

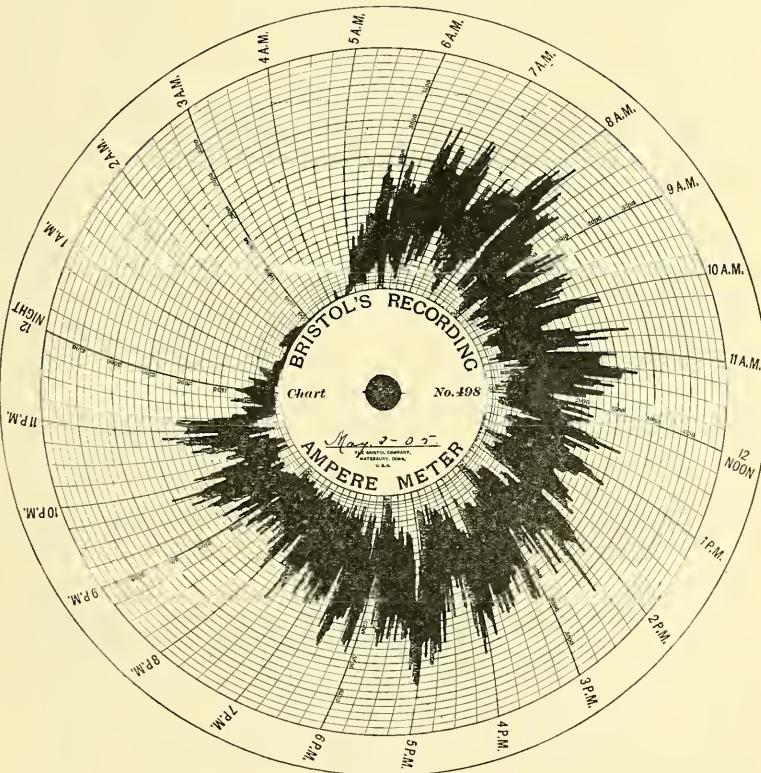


Fig. 7.

speed regulation are as well suited to both D.C. and A.C. generator driving as the standard cross compound steam engine; that the gas engine is as simple a machine to operate; that its efficiency as a mechanism is high, and as a heat motor far higher; and that its overload capacity is largely dependent upon the dimensions of the customer's purse. Assuming, then, that the gas engine is already established in its position, we come to the gas generating plant, which, in many respects, is the crucial point of the system, except in special localities where natural gas is available at reasonable prices.

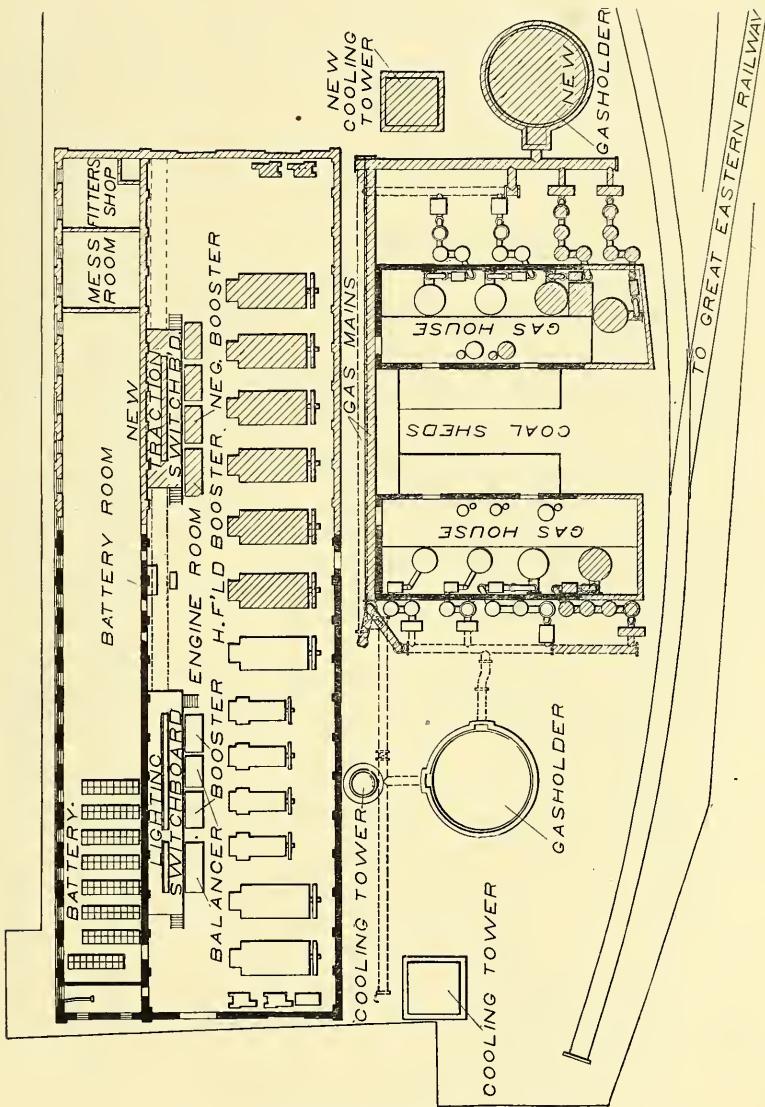
#### **The Producer.**

We believe ourselves conservative in the statement that the future of the gas engine in its general application depends largely upon the development of a producer gas system especially suited to the use of low grade bituminous coal. Anthracite producers have already reached a high state of perfection, are reasonable in price, simple to operate and are usually unencumbered with much auxiliary apparatus. They do not deteriorate rapidly, and generally show an efficiency higher than the best steam boiler and furnace, viz., 75-80 percent.

The ideal bituminous producer is yet to come, viz., one in which the volatiles are completely converted into fixed gases without serious loss and without complication of the operating system. There are a number of makes now on the market intended to be used with bituminous coal, but when the gas is to be used in engines they are attended with special, and often complex, cleaning apparatus for the removal of suspended impurities. The efficiency of bituminous systems is also generally lower than anthracite, not only owing to the fact that some of the valuable distillates are lost, but on account of the distillation of volatile matter requiring heat for its accomplishment. Present types, however, sometimes exceeds 70 percent. efficiency, which rivals that of the best boiler plant.

#### **Fuel Economy.**

In actual running, fuel consumption, gas power presents its most striking advantage over steam. It is difficult to obtain statistics truly comparative in every respect. Some data, trustworthy in the aggregate, are available from the tests conducted during the past year at St. Louis by the United States Government. Table 2 gives a resume of these tests, covering 17 different grades of coal, all of bituminous character. The most remark-



Plan of Walthamstow Gas Power Station.

able result is that the poorest grade coals and even lignites are entirely suitable for producer work. Thus, Montana, North Dakota and Texas lignites, averaging only 8,242 b. t. u. per pound (11,400 dry) yielded a gas of 169 b. t. u. per cubic foot, a gross produced efficiency of 66 per cent., and a duty of 2.5 pounds per K. W. H. dry, or 3.6 pounds per K. W. H. as fired. The best coals (West Virginia) gave an actual duty of 1.57 pounds per K. W. H., and the poorest  $3\frac{1}{4}$  to  $4\frac{1}{2}$  pounds as fired. The average of the 17 tests showed a plant duty of 2.2 pounds per K. W. H. dry, or 2.5 pounds as fired. Fig. 8 shows, in a general way, the rapid decrease in coal consumption with higher grade coals.

It is fortunate that the government extended these tests to embrace steam\* as well as gas power. Fig. 9 shows the results of comparative economy tests with practically the same size plant under identical conditions and with identical coal. Taking a common heat value for average bituminous coal, 13,000 b. t. u. per pound, we observe that the plant duty is less than 2 pounds per K. W. H. with gas and  $5\frac{1}{2}$  pounds with steam. Furthermore, the fuel consumption of the steam plant increases much more rapidly in the comparison with the poorer grades of coal. This is reasonable, owing to the greater difficulty in securing proper combustion. In this particular the producer has a decided and important advantage over the steam boiler.

Many more results might be cited which would strongly emphasize the high gross economy of the producer gas power plant; yet it is not the formal efficiency test at full load, but the long period test which reveals to the operating man the fullest economy of gas working.

The following results may be of interest, as obtained from a large gas power railway and lighting plant at Walthamstow,\*\* England, which will later be mentioned in further detail.

TABLE NO. III.  
RESULT OF 12 DAYS' OPERATION, WALTHAMSTOW,  
LONDON, JANUARY, 1902.

Average output per day in K. W. H.....	1,525
Average load in kw.....	64
Average load factor .....	35%
Coal (anthracite) per K. W. H. in pounds, including fuel for boiler and banking...	1.78

\*Non-condensing.

\*\*Walthamstow is one of the largest suburban districts of London, having a population of 116,000, and served by a gas driven central station.

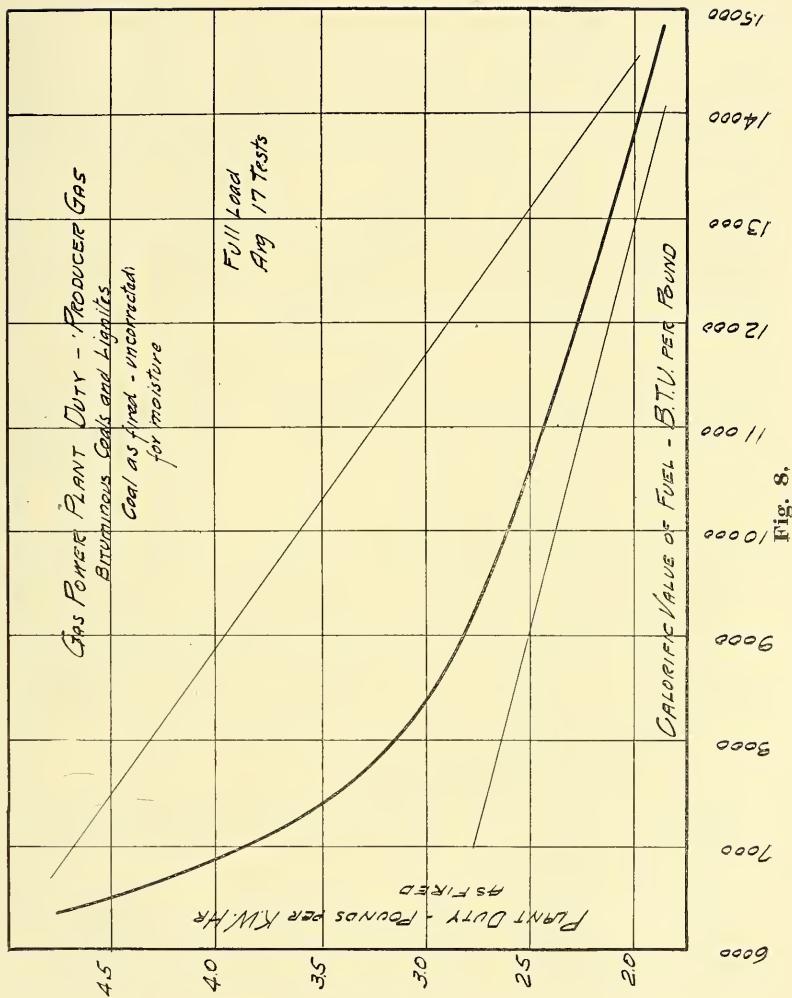
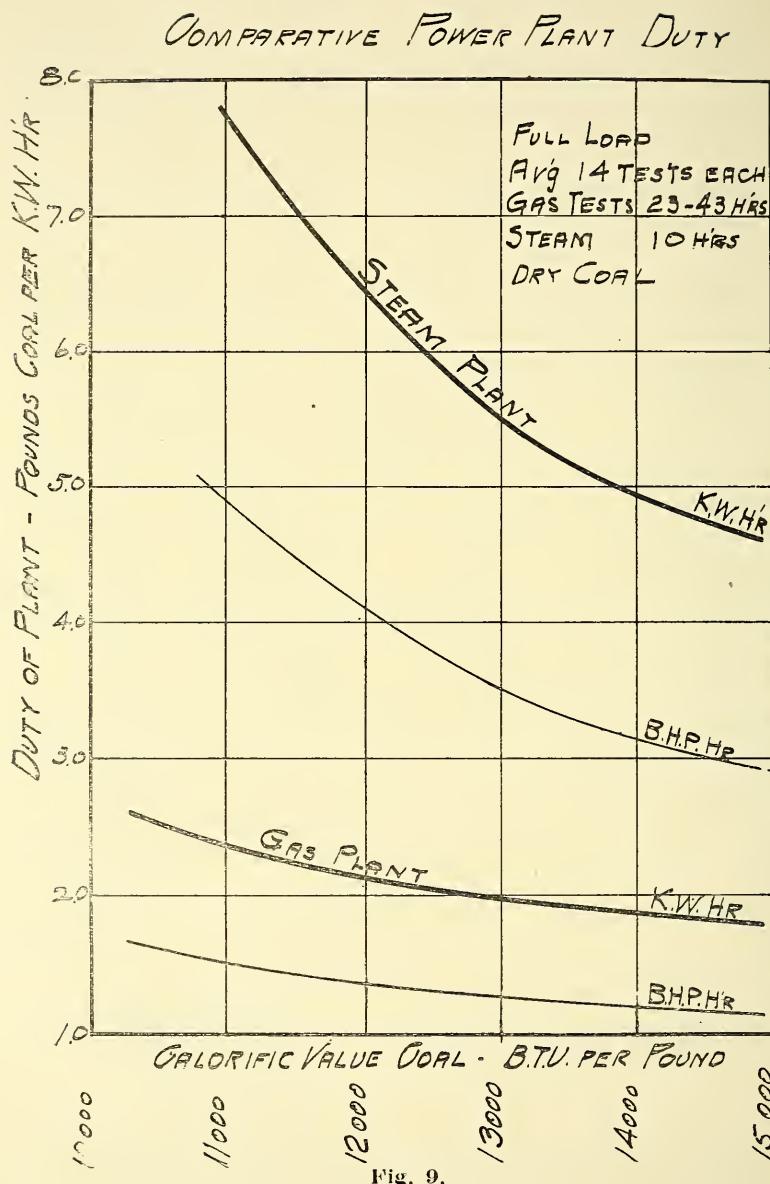


Fig. 8.



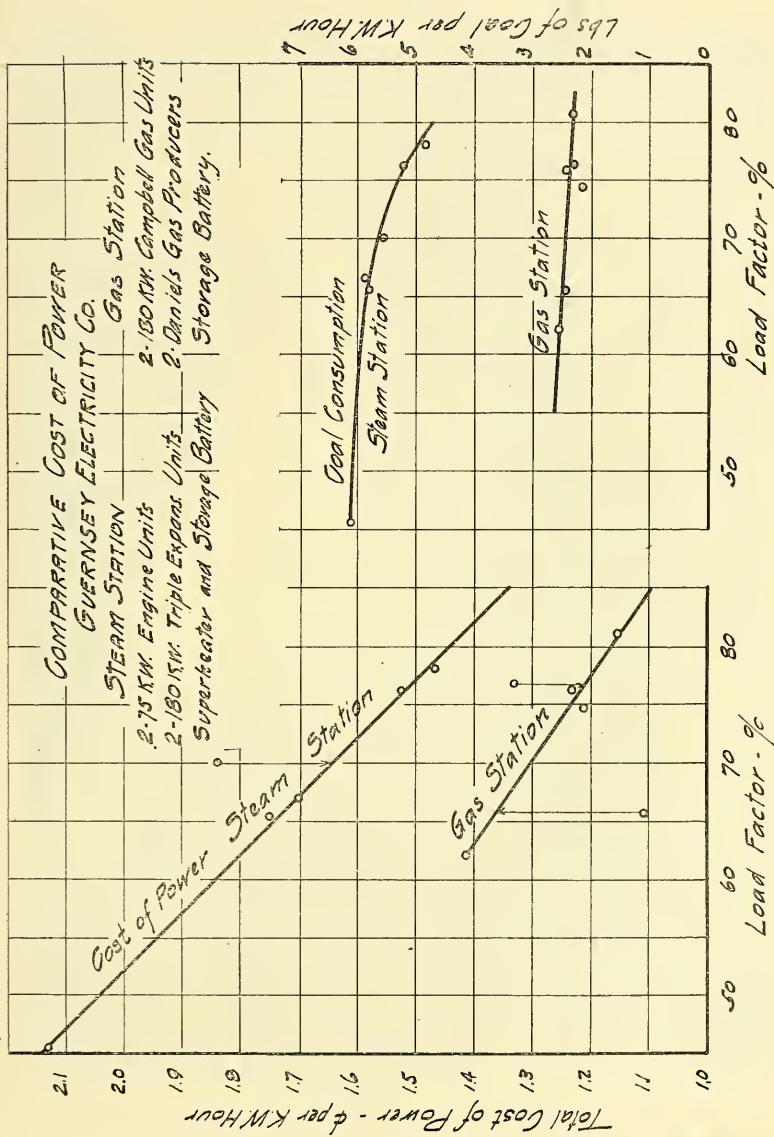


Fig. 10.

A striking series of comparative observations\*\*\* between a steam and gas station operated by the same company at Guernsey, England, is summarized in Fig. 10. With approximately the same load factor, which is high, owing to power supply, the gas plant consumed about 2.25 pounds per K. W. H., and the steam station 5.5 pounds, although a much larger station and equipped with triple expansion high speed engines.

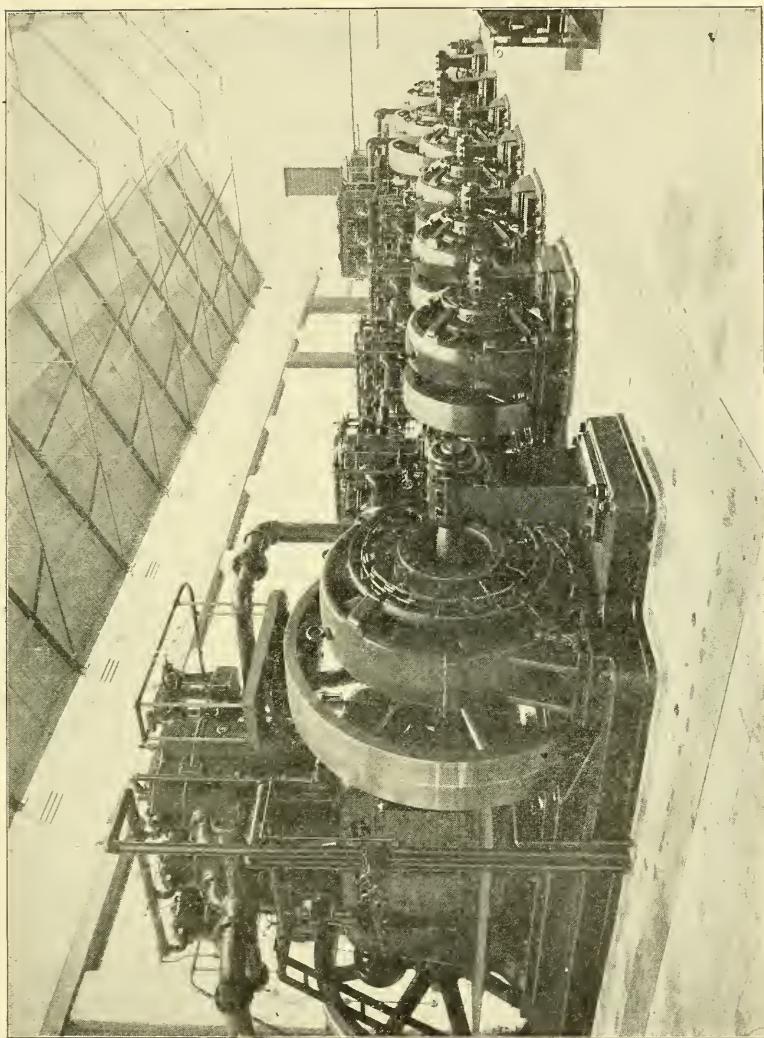
#### **Responsiveness.**

Passing to some of the practical points, a producer, if provided with an automatic blast control, may be made almost instantly responsive to variations in demand for gas. This is shown by the success which the suction producer has attained in small sizes; and in this respect the steam boiler is quite outclassed, owing to the more direct effect of the blast in transferring the heat content of the coal to the working medium—gas. In one type of producer familiar to us as possessed of this automatic feature the steam blast, and consequently the gas generated, is controlled entirely by the pressure in the delivery gas main and in inverse proportion. It combines this feature with the conservation of the sensible heat of gases leaving the producer. By this means the steam is generated at a rate proportional to the demand for gas without requiring a special boiler equipment or fuel. This largely increases the producer efficiency. In some types of producer we recall that the fuel for steam amounts to as much as 15 to 20 percent of the total coal gasified.

This producer is designed for use without a gas holder and has been successful in this particular. The especially severe conditions of heavy railway work, however, prescribe storage capacity at some part of the system owing to the limitations of gas engine capacity dealt with in the preceding paper. Electric storage is evidently the most desirable, as it relieves the machinery of the wear and tear of fluctuating loads. There is ample precedent the world over for the use of a storage battery auxiliary in railway plants, and it should prove even more desirable in a gas power than in a steam power plant. In fact, gas storage is often to be desired in many plants where the gas demand varies greatly, simply as an insurance against poor gas, due to careless operation. This, however, relieves the gas generating equipment, while electric storage relieves the entire station.

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\*\*\*Campbell, Mechanical Engineer, December 3, 1904.



800 H. P. gas power railway and lighting station, Borough of Walthamstow, London,

**Losses.**

Standby losses in a steam power plant are an important source of inefficiency and they are difficult to determine accurately. Mr. Dowson has made some comparative observations\* with eight steam plants and several producer plants, averaging about 250 H. P. capacity. The actual standby fuel consumption of the boilers was 35-180 pounds per hour and of the producers 2-4 pounds per hour. Whether the exact ratio holds for larger plants is immaterial. We do know that the producer losses are almost inconsiderable, which is reasonable, owing to the great heat content of the fuel bed and small opportunity for loss of heat by radiation when the producer is shut off from the atmosphere. Running losses are evidently also much less. We may pipe gas for great distances with small loss. Not so with highly superheated steam under high pressure. When a gas engine plant is shut down the losses practically cease; with steam, condensation is uninterrupted.

**Labor.**

The comparative cost of labor and supplies for gas and steam plants is difficult to state in definite terms. With the same character of labor there should be no appreciable difference between the two. We have compiled table 4 (appendix 3) to show the operating costs of 11 London district stations, as compared with the gas plant at Walthamstow. These plants have been chosen, as they are located similarly in respect to the accessibility of fuel. The table shows labor cost slightly in favor of steam, but it must be remembered that that is a comparison of one gas plant, having small units, against a number of larger steam plants, and it might readily be more favorable in larger gas installations. With an up-to-date steam plant, using high pressure steam, superheaters, economizers, high grade condensing apparatus and the like, the labor item should, if anything, exceed that of a gas plant equipment of the same grade. At the two Guernsey stations referred to above the labor cost averaged very nearly the same for steam or gas.

It is true that a gas plant cannot be successfully operated by an ignoramus, any more than can a high grade steam plant, which, however, if allowed, results sooner or later in a swelling of the repair account. A fair comparison will not admit of any but intelligent labor in either steam or gas plants, so there is no

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\*Journal of Institution of Electrical Engineers, April, 1904.

reason why steam engineers, after proper instruction, cannot take charge of a gas plant, as has been proven in practice.

A very important point, however, is the personal attitude which engineers take toward gas machinery. The best plant will quickly depreciate in the hands of operators who have taken a personal dislike to the innovation. The inevitable result cannot be truthfully laid to the door of gas power. But it is almost always the case that personal prejudice can be overcome by systematic educational methods. In many of our plants the old steam engineers and oilers have been retained and placed in charge of gas equipment, after a thorough coaching by erecting engineers. After this is done properly the invariable result is highly successful operation.\*

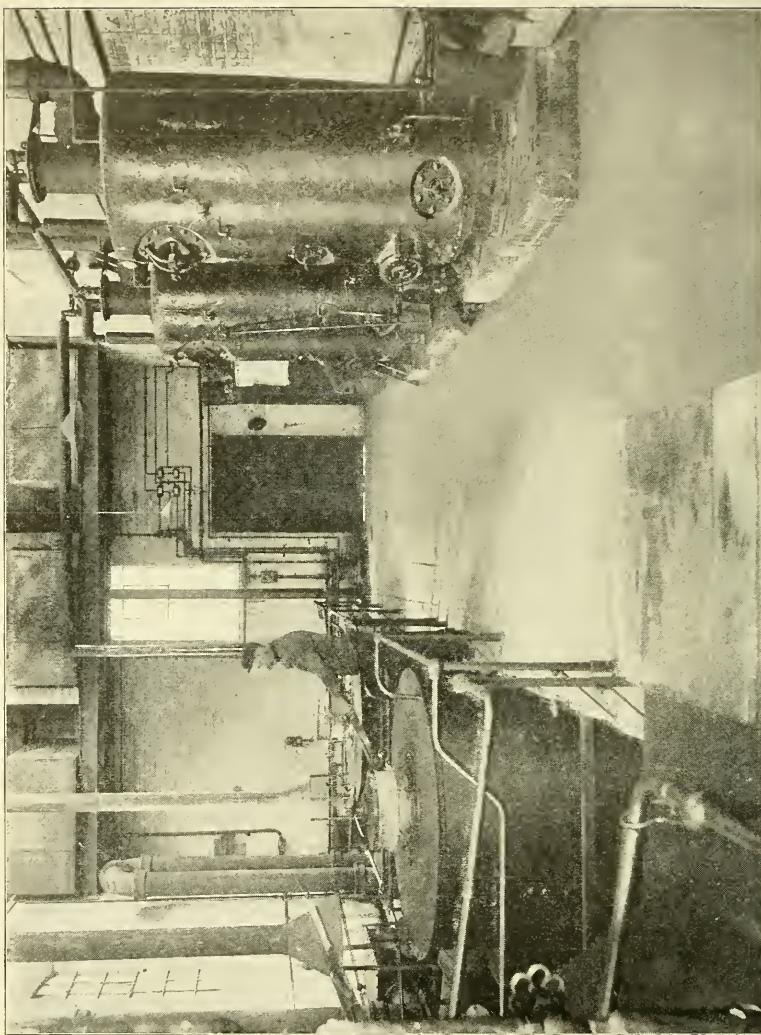
#### Oil.

In well regulated plants, equipped with a continuous return system, the oil consumption should not much exceed that of a steam plant. Two 500 kw. gas plants at Franklin and Bradford, Pa. each consisting of five Westinghouse vertical enclosed type engine units), average through the year less than a half a gallon per unit day, at a total cost of under seven cents (.0032 gallons per H. P. day). At another station, near Warren, Pa., using three vertical open type engines of 275 H. P. capacity each, the oil consumption averages under .9 gallons per unit day. This is certainly not excessive; in fact, we know of a large steam station in the Pittsburg district, equipped with several 1,600 H. P. cross compound engines, in which the oil consumption averages .0025 gallons per engine H. P. day, and has reached double this amount for weeks at a time. This plant has a return oiling system; the others have not.

#### Maintenance.

Maintenance expense is frequently thought to be excessive in a gas station. When this is so we may look for faulty operation or design of the plant. Recent data from the station at Bradford, Pa., shows what may be accomplished when the equipment is properly operated. The plant is in its seventh year of service; yet the average cost of repairs on the engines for the last two years was \$92.70 per year, 11.6 cents per H. P. year, or .0125

\*As the Chief Engineer operating a plant in northern Pennsylvania stated to the author recently, "I would rather throw up my job than go back to steam." He freely acknowledged his initial prejudice, which disappeared as he became acquainted with the gas engines.



Walthamstow station producer house, charging floor.

cents per K. W. H. generated. Returns for the last two years are shown in Table 5 (appendix 4). As an example of the results secured we may mention the following: After six years' service, averaging 18 hours per day, it is found necessary to inspect the engines only once in twelve months. This was formerly done in three months and later in six months. At each inspection a set of piston rings is replaced by new ones, whether worn out or not. Up to the present time no extensive repairs have been made on any of the engines, except a voluntary change, on the builders' part, from dry to water cooled exhaust valves. The present exhaust valves average one year's working without regrinding, and even then are not in bad condition. Some valves have run 15 months. Admission valves require no attention. Igniters average about nine months without repointing. By reversing the current each day electro deposition is entirely avoided, so that the points wear evenly.

In Table 4 the repair costs at Walthamstow are much lower than the steam plants cited. In a 300 kw. manufacturing plant at Birmingham, using Westinghouse vertical engines and Mond gas, the typical year's expense for repairs and renewals was but 0.174 cents per K. W. H. generated, incurred in the proportion of 65 percent. to the gas and 35 percent. to the engine plant.

A notable run was recently reported by the superintendent of a gas compressing station in central Ohio, where a 650 H. P. Westinghouse vertical engine is at work.\* This engine was under maximum gas load continuously night and day for 40 days, without a misfire or mishap of any kind, and without incurring extra expense for repairs.

#### Cost of Power.

Comparative plant economy is best brought out in figures expressing the total operating cost of power. The complete returns from Walthamstow are shown in table 6 (appendix 5). With a load factor of only 15½ percent, and coal at \$6.75 per ton, delivered, the total cost of generating current was 1.7 cents per K. W. H.; or based upon current delivered to consumer, 2.13 cents per K. W. H., the average price obtained being 7.14 cents, and the net profit 9 percent. Referring again to table 4, the

\*After running practically day and night for nearly 3½ years the total repairs on the plant have been:

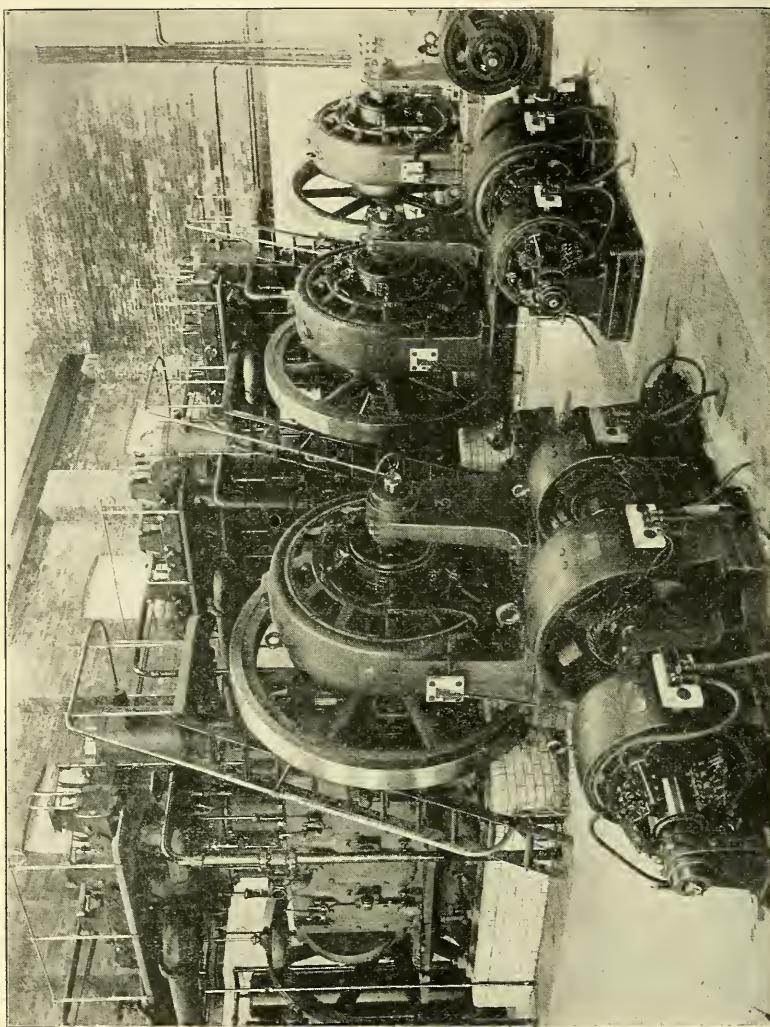
One set of igniters.

Two sets of exhaust valves (one spare).

One admission valve (jammed accidentally).

One cylinder head (cracked from mud deposits).

One intermediate gear.



Midland Railways dock terminal power plant, Heysham Harbor, England. General view of engine room.

summary shows that in the average borough steam plant of over three times the capacity and of higher load factor, the generation cost is 2.2 cents. It is presumable that the steam plants used cheaper coal; yet with gas coal at \$6.75 a ton the saving in cost of coal alone was over 38 percent. in favor of the gas station. At this price the Walthamstow plant required throughout the year's run but slightly over two pounds of coal per K. W. H. generated. Of the total operating cost, fuel represented 43 percent.; in the steam plant, 55 percent.; repairs, 5 percent. for gas, and 20 percent. for steam. At the Birmingham plant, mentioned above, the total operating cost was  $1\frac{1}{4}$  cents per K. W. H., of which fuel represented  $26\frac{1}{2}$  percent. and repairs 14 percent.; this on a load factor of 43 percent. average, and bituminous coal having 31 percent. volatile. The total coal consumption averaged 2.9 pounds per K. W. H. through the year.

At the Bradford, Pa., station (see table 5, appendix 4), although handicapped with old type belted machinery, the average yearly gas consumption is less than 25 cubic feet of gas per K. W. H. on  $19\frac{1}{2}$  percent. load factor, and a total operating cost of power of about 0.8 cents per K. W. H.

The station at Franklin, Pa., operating on natural gas of exceptionally high calorific value, gives experience of similar character. The engines regularly operate thirty hours to a run. With a load factor of 15 percent. to 20 percent. as low as 17 cubic feet of gas per K. W. H. was recorded for the year 1904, at a total operating cost of under one cent per K. W. H. In the cases of both the Bradford and Franklin plants building heating by natural gas is included in the gas charge for the engines.

#### **Capital Cost.**

Much of the prejudice against gas power is due to exaggerated statements regarding the comparative capital cost of steam and gas equipments. In some instances it has been stated that for the same character of equipment the gas plant costs double. This is not the case; in fact, in larger plants the two may be brought nearly to a parity, and the higher economy of the former will soon wipe out the difference in actual cost.

We cannot do better than cite the returns\* of tenders for one of the largest power stations in Europe, over 8,000 kw. capacity and designed for both railway and lighting service. Tenders

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\*For obvious reasons the names of the customer and manufacturers are withheld.

were invited for both steam and gas equipment complete, in every respect the best obtainable and with considerable spare plant. An approximate summary of the tenders received from over thirty of the most prominent European manufacturers is as follows, including erection, but not including transportation charges:

TABLE No. VII.  
CAPITAL COST GAS AND STEAM PLANT PER  
K. W. CAPACITY.  
(From actual tenders on European plant).

	GAS PLANT		GENERATING PLANT		TOTAL
	\$ / K. W.	% Total	\$ / K. W.	% Total	
Average tender....	35.00	31.2	77.00	68.8	112.00
Accepted tenders...	24.00	24.5	74.00	75.5	98.00
STEAM PLANT					
Lowest tender....					75.00
Highest tender....					106.00
Mean tender....					90.00
Recommended....					92.00

TABLE No. VIII.  
SUMMARY OF GUARANTEES.  
(From actual tenders on European plant).

GUARANTEE	PRODUCER PLANT		GENERATING PLANT % Rated Load			POWER STATION	
	B. T. U. in Gas Per Lb. Coal	Eff'c'y with 12,000 BTU Coal %	B. T. U. per K. W. H.	B. T. U. per B. H. P. Hr.	Kinetic Eff'c'y %	Kinetic Eff'c'y with 12,000 BTU Coal	Plant Duty * Lb. Coal Per K. W. H.
Highest....	9,500	79.2	12,300	10,440	27.7	2.19	1.29
Lowest....	7,000	58.3	18,000	15,290	19.0	11.10	2.57
Average....	8,729	72.7	13,876	11,775	24.6	17.85	1.59
Accepted...	8,500	71.0	13,700	11,630	24.9	18.10	1.61

The engineer's report on the accepted tenders shows a total excess cost of gas plant of 7.4 percent. actual, or 14 percent. with certain extras charged to the gas plant for additional ground and building requirements; yet the annual saving in operation is estimated sufficient to annul the excess cost of gas plant in less than two years. Capitalized at 5 percent. interest this annual saving represents a capital of \$1,485,000, or considerably more than the original cost of the entire gas power station. In other words, the gas plant might have cost twice the actual amount and still realize a definite annual saving over steam power. Incidentally the efficiency guarantees are of interest. These are shown in table 8. The heat conversion efficiency of the generating equipment at two-thirds load is as high as 25 percent., giving an overall plant efficiency of about 18 per cent. The average well equipped steam plant rarely exceeds 10 per cent.

The problem of gas vs. steam power thus partakes of the nature of economics, rather than mechanics. In order to demonstrate more clearly, the diagram, Fig. 11, was prepared, which shows the relative cost of steam and gas power from different grades of coal. By expressing the cost\* of the latter in million thermal units, the differentials in transportation are avoided. The diagram is based upon an actual load curve,\*\* Fig. 1B, and the present approximate cost of power plant equipment, f. o. b. factory, but including erection. From the assumptions, appendix 6, you will observe that if we have erred it is upon the conservative side, favoring, if anything, the steam plant, especially in the matter of cost.

In this diagram the shaded area represents reasonable range for capital cost of gas engine. You will observe that the diagonals for steam and gas intersect at the left of the diagram. The interpretation of this is that at this point, with coal costing 3.5 cents per million b. t. u., or about 90 cents per ton, both plants can deliver power at the same cost, or, in other words, we cannot afford to use gas plant with cheaper coal. Fig. 12 expresses this saving in percent. of excess capital cost of gas over steam plant. Thus, with coal at \$3.50, the annual saving is 30 percent. of the original excess.

Upon the assumption of equal labor, supplies and repair costs, it is quite evident that any excess fixed charges in the gas plant

\*In estimating the cost of labor, supplies and repairs, these three items are assumed to be the same for either steam or gas plants, as it is a reasonable assumption that any possible excess cost of upkeep on the gas engine equipment would be balanced by the smaller expense of maintaining the producer equipment.

\*\*Railway load curve, Fig. 1.



Mond producer plant at Heysham Harbor, showing coal handling apparatus.

will fix a definite economic limit of saving over steam, and it thus occurs that gas will be more effective where fuel is not dirt cheap. If, however, a gas plant can effect a saving in the cost of labor, supplies and repairs, as is the case at Walthamstow, then it may be operated to advantage on still lower grades of coal.

#### Field Practice.

This subject may be well concluded by a brief perspective, as it were, of the work that has already been accomplished in the American gas power field. To be sure, the application to railway service has in this country been limited; yet we find abroad many evidences of successful working. A prominent European engineer reported in 1903: "Nineteen stations on tramway work, totaling 6,000 H. P. capacity. These include Barcelona, Tunis, Lausanne, St. Gallen, Poictiers, Orleans and Zurich, from 400 to 600 H. P., each working on either producer or town gas." As a result of the excellent experience with the Walthamstow electricity station, 650 H. P. has been added to the plant for operating the new tramway system\* recently constructed. At Buenos Ayres, South America, two plants, aggregating 2,240 H. P., are at work for the Buenos Ayres Great Western and Great Southern Railways. Both use Mond gas.

But, eclipsing in interest probably all former gas power railway undertakings is that of the Warren and Jamestown Railway system\*\* now under construction. As the details may not be entirely familiar to you, a brief review is appended (No. 7). This plant will practically inaugurate the use of the heavy duty type engine, in connection with single phase railway systems in America.

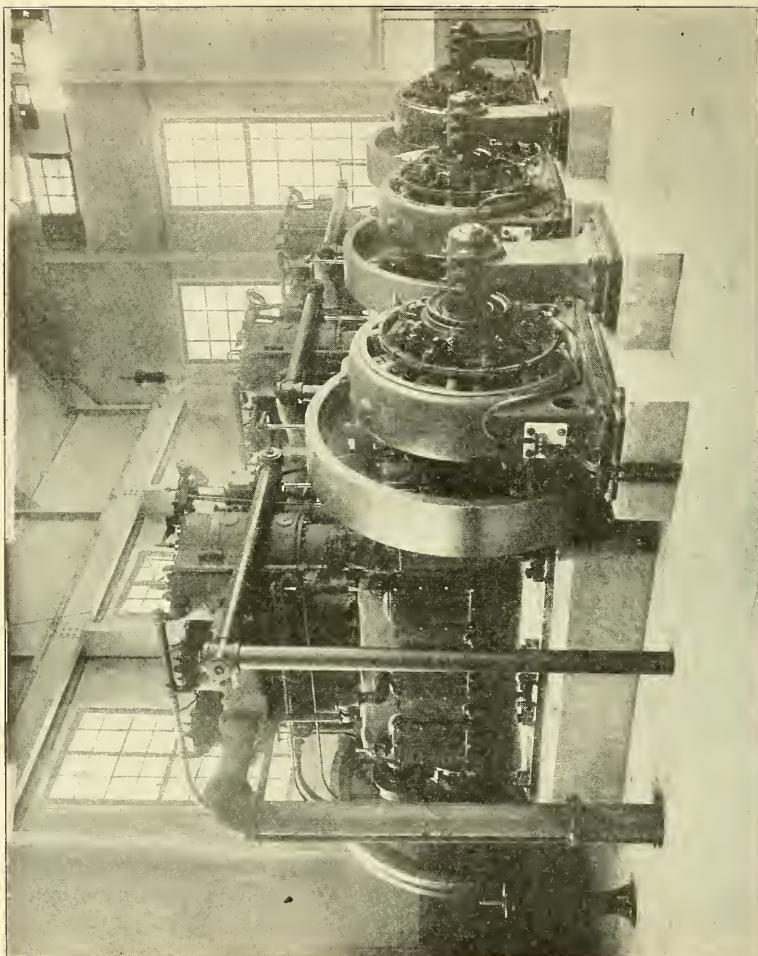
The new engine equipment, now nearing completion, consists of two 500 H. P. Westinghouse double acting engines of the horizontal tandem type,\*\*\* each direct connected to a 260 kw. A. C. engine type generator. These engines are both of the single crank type, but with the tandem arrangement, a power stroke is developed at each half revolution, as in the double acting steam engine. The gas units will operate in parallel on the electrical

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\*Length of line 9½ miles, 100 pound girder rails, 32 double deck single truck cars, double trolley.

\*\*Following the precedent established by the Warren plant, the Union Traction Company, of Independence, Kansas, has adopted double acting engines of the same size, type and design for railway service, using Kansas natural gas as fuel. The initial equipment will comprise single crank and double crank units of 500 and 1,000 H. P. each (sea level rating).

\*\*\*Dimensions of engines: Cylinder diameter, 21 inches; stroke, 30 inches; speed, 150 r. p. m.



Section of 1,900 H. P. industrial gas power plant Winchester Repeating Arms Company, New Haven, Conn., showing sole plate pier construction.

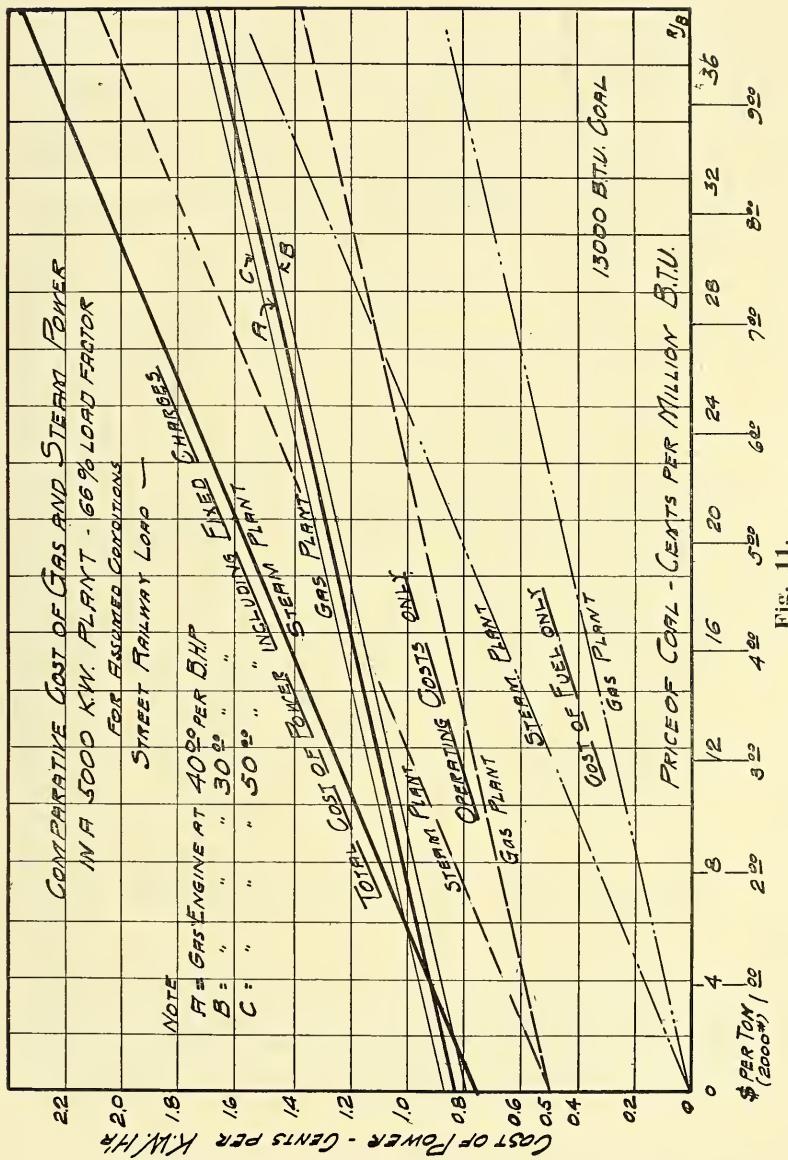


Fig. 11.

end, without the necessity of synchronizing the cranks.\* Owing to the absence of battery and the small number of cars, the plant will be subjected to the most severe test possible. It is estimated that one generating unit will take care of the present maximum demand with two cars starting and two running.

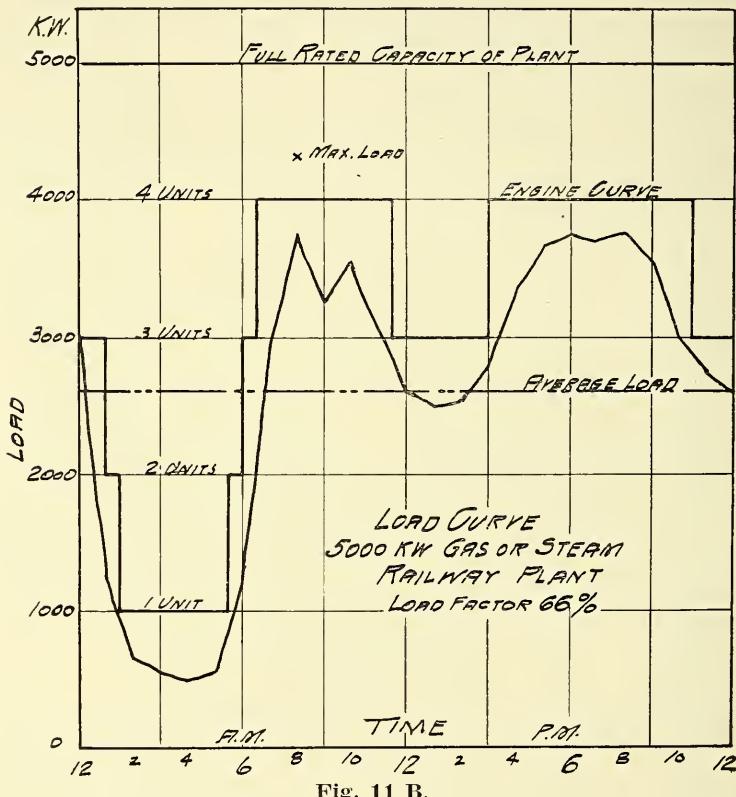
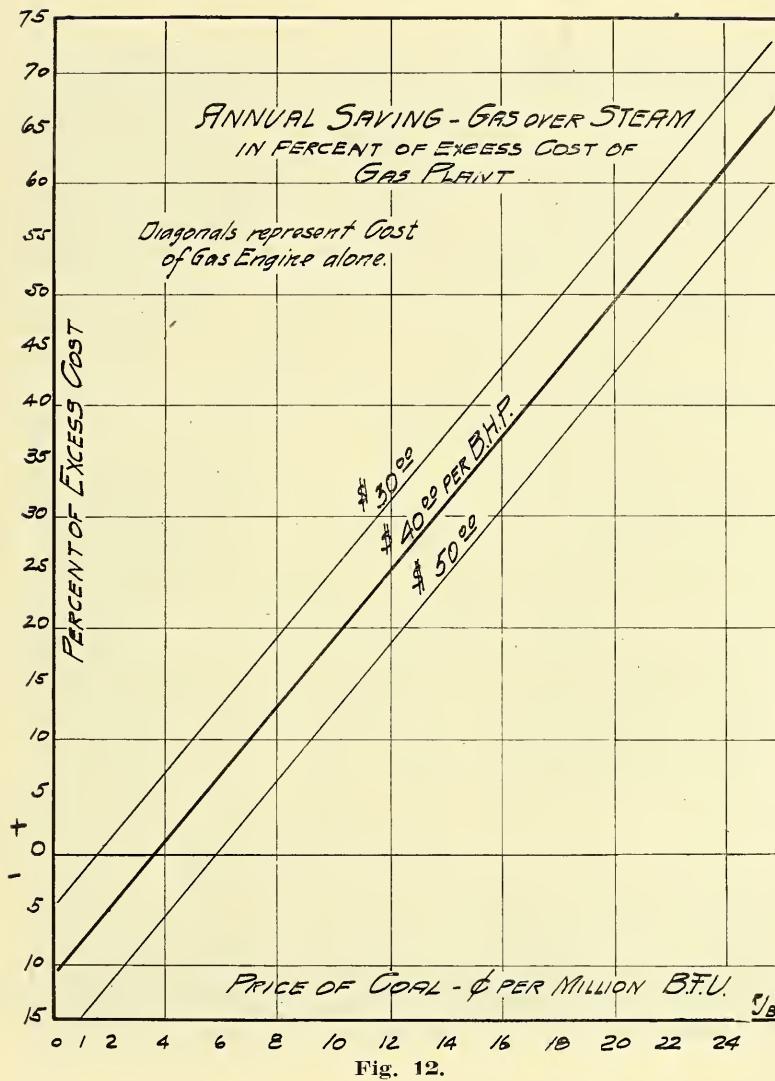
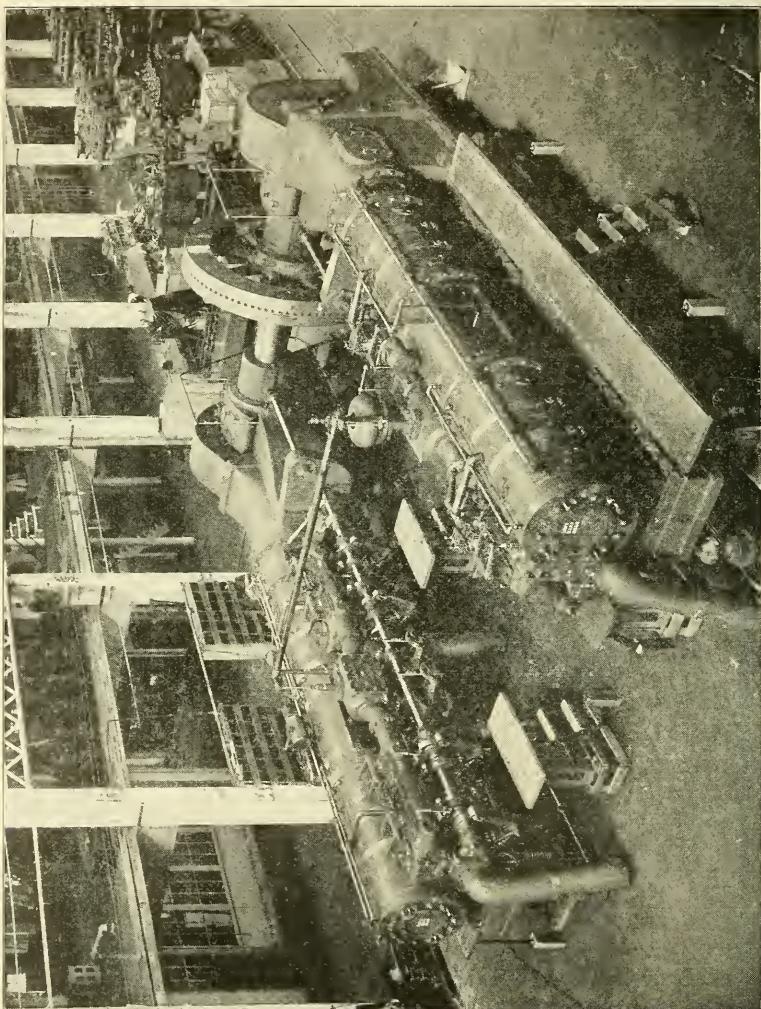


Fig. 11 B.

Natural gas fuel is entirely used in this territory, and at the present price and heat value will correspond with producer gas delivered at a cost of about two cents per thousand cubic feet. The economy in operating with natural gas is striking. In the old gas plant it is estimated that the cost of power averages .75

\*The cyclical speed variation and the governor regulation is sufficient to meet present A. C. generator specifications.





1,000 H. P. Westinghouse double acting gas engine for industrial works service at Winchester Repeating Arms Company, New Haven, Conn.

cents per K. W. H., including all items chargeable to operation, except repairs on building and battery; the corresponding gas consumption being 20 cubic feet per K. W. H.

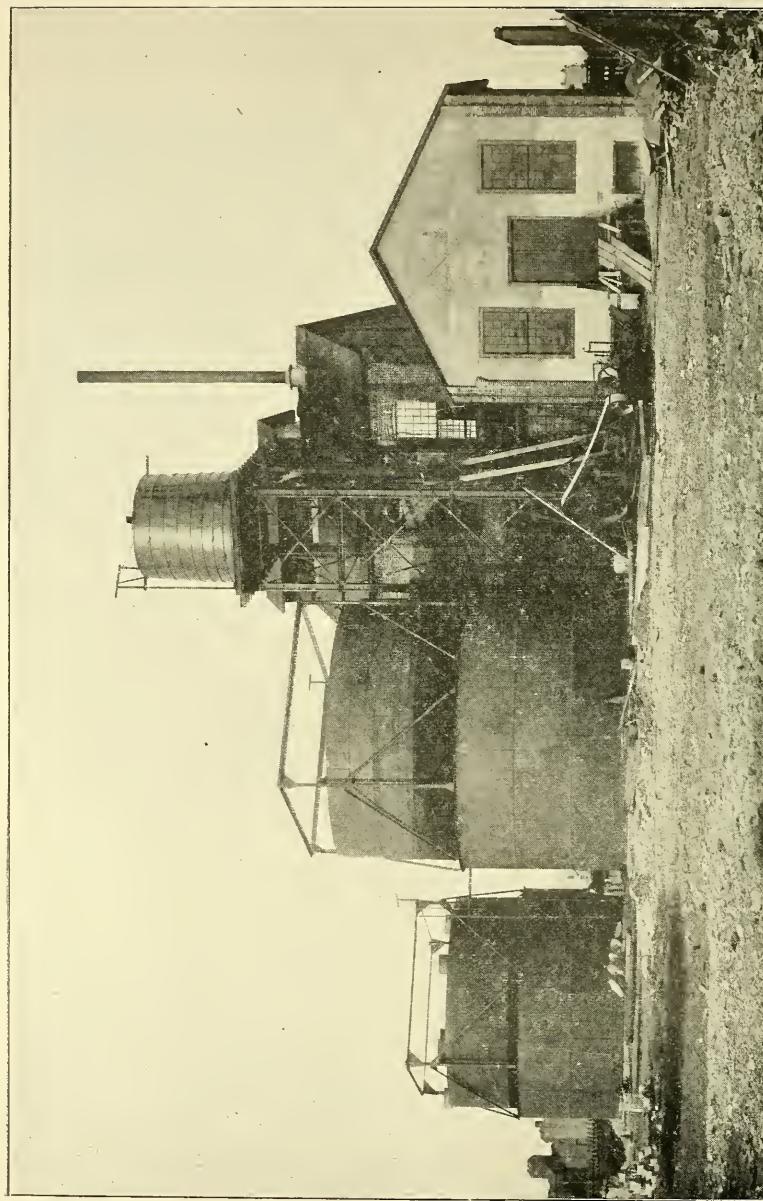
Among gas power stations in American and British territory we find a large number up to 2,600 H. P. capacity operating on producer, natural and oil gas, and many with the A. C. system with generators running in electrical parallel. In fact, parallel operation by gas engines on a large scale was first accomplished in this country in East Pittsburg, with three cylinder engines of the vertical single acting type. In view of the success with this type of engine, it is evident that the tandem and twin-tandem double acting type should be even more suitable. In Great Britain 20 central stations, from 40 to 2,000 kw. in capacity, are in operation, mostly with producer gas.

In the field of electric lighting much has been accomplished. Outside of the Walthamstow station, already mentioned, an interesting plant is the 1,150 H. P. station of the Rockland Electric Company, at Hillburn, N. Y., equipped with Westinghouse horizontal double acting engines, operating on Loomis-Pettibone producer gas. As in several other industrial plants using this type of producer, most of the water gas generated is used for furnace heating, while the "air" or "blow" gas, too lean for other purposes, is used entirely in the engine plant. In many respects this system is unique, in that it makes possible the commercial use of otherwise expensive water gas, while the cheap "air" gas is rendered useful for generating power.

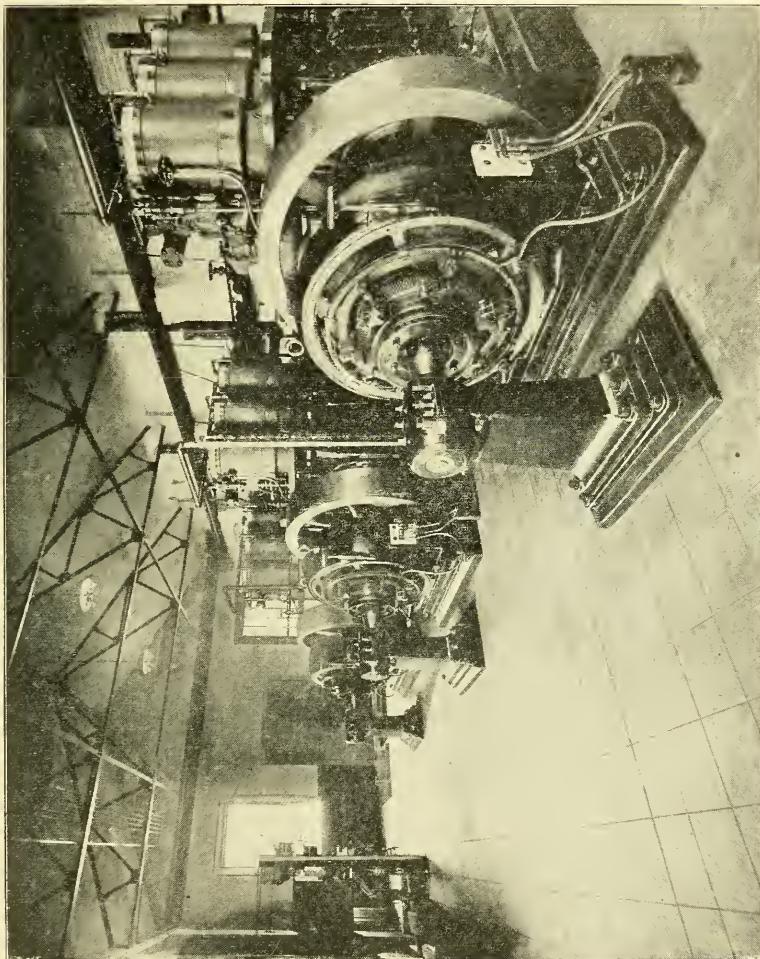
The utilization of waste products of manufacture has within recent years made great progress. Gaseous by-products have already been put to use on a large scale, but the near future may readily witness the use of the producer in its present or modified form for utilizing all combustible wastes recoverable in manufacturing processes. Blast furnace gas applications are now more or less familiar; coke oven gas from by-product coke ovens has many notable applications in Europe (a small plant is in use at Camden, N. J.); and oil gas (obtained by fractional distillation of petroleum—a by-product in the refining process) has lately been successfully applied in America.

#### **Summary.**

The large number of small plants that have come within our range of experience has not prevented us from obtaining similar experience from larger ones. The operation of close to 100 plants, from 200 to 2,600 H. P. in capacity, would seem to indicate



Typical gas power plant for combined power and metallurgical service. Atha Tool Company, Newark, N. J.



Engine-room of Atha Tool Company, showing generator sole plate construction.

that some measure of success has been attained. That one-half of the aggregate capacity operates on natural gas and but one-third on producer gas simply emphasizes the value of the country's natural resources, rather than reflects on the producer gas system, especially when one considers the comparatively short time that producer gas has been seriously taken up. About 10 percent. of the larger plants (above 200 H. P.) operate city and suburban railway systems. The remainder are devoted to many classes of service, such as light and power for city and suburban territory, power for the electrical driving of industrial works, power for operating railroad terminals, gas compressing stations, water pumping plants and high service fire systems. A notable example of the latter is the 2,200 H. P. station in Race Street, Philadelphia. Most of the prominent types of producers are represented, including the Mond, Loomis-Pettibone, Taylor and the more recent Westinghouse system. A few small plants are working on suction gas. This indicates that successful operation is not confined to any particular type of producer.

In conclusion we can but reiterate our premises:

1st. That the gas engine has been brought to a state of development where it is capable of doing the same work as the steam engine, with far greater efficiency, and usually at reduced cost.

2d. That the producer has been so far perfected as to be a reliable and more efficient generator than the steam boiler.

3d. That the gas power plant "in toto" is entirely suitable for even the severe test incident to electric railway operation.

4th. That its component parts, engine and producer are possessed of characteristics leading to harmonious co-operation.

5th. That practical difficulties incident to gas power working have been so far overcome as to warrant commercial confidence.

6th. That experience with gas power in almost every known line of modern industry has proven its general sufficiency for any power service.

Such data as has been obtainable are presented in the light of a record of past performance rather than in the nature of prophecies, regarding the future. The future is believed to be already assured.

Respectfully submitted,

J. R. BIBBINS.

## APPENDIX NO. I.

## CHARACTERISTICS OF RAILWAY LOADS.

The various systems may be classified as follows:

**Metropolitan:** Light cars many in number, small headway (one to five minutes), small load fluctuation—yielding a station load that may be readily predicted and closely followed up by the requisite engine capacity.

**Urban** Light cars, few in number, medium headway (ten to fifteen minutes), station load fluctuating considerably.

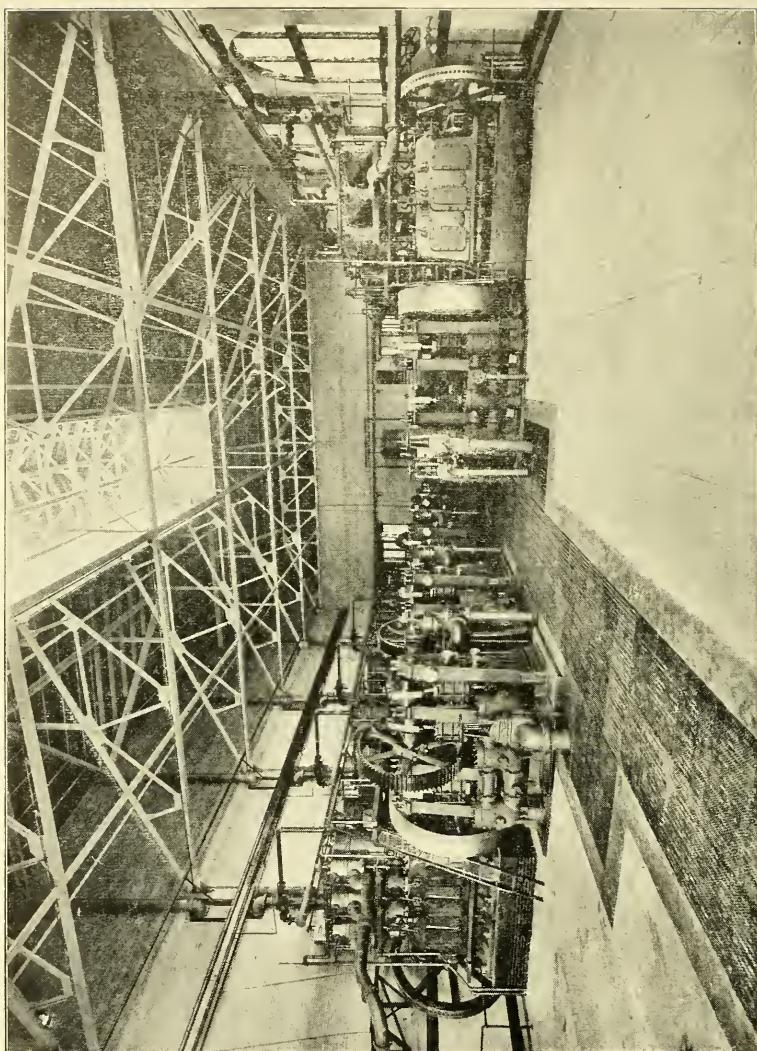
**Interurban:** Heavy cars, few in number, large headway (30 to 60 minutes), high speed, moderate acceleration, heavy grades, load violently fluctuating, cannot be closely predicted.

**Rapid Transit:** Heavy cars, multiple unit trains, small headway at rush hours, rapid acceleration, load fluctuating at sub-stations.

Specific examples may be found in the accompanying curves, which are explained in table No. 1. In all the city systems the morning and evening peaks are strongly accentuated and the daily average is high. Owing to the superposition of loads from various distribution centers or sub-stations, the fluctuations at power stations are not necessarily severe. With heavy service, however, sub-stations are subjected to severe fluctuations: e. g., Manhattan sub-station No. 2, shown in Fig. 4, where the fluctuation is 40 percent. above and below the average load.

The interurban load presents less distinct peaks, but, although the average is high, the station is subjected to violent fluctuations. This may be appreciated from the recording meter chart, Fig. 7, corresponding to the load curve shown. Although the inertia of the instrument pointer has probably exaggerated the indications, it is safe to say that the fluctuations of 30 percent. from the mean load are ordinarily encountered with a reduced number of cars, as high as 60 percent.

The characteristics of electric lighting service, on the other hand, are quite different. Except in the case of occasional storms, the load may be closely predicted and followed up with the necessary generating capacity, and rapid fluctuations are practically absent.



2,200 H. P. high pressure fire pumping station, City of Philadelphia.

TABLE No. I.—Appendix No. 1.  
LOAD CHARACTERISTICS.

Fig. No.	Character	City	*Load Factor %	Ratio Loads			Approx. Fluctuation % $\pm$	REMARKS
				Max.	Max.	Min.		
1	Metropolitan	Pittsburg	68	7.7	1.48	10-15	300-400 cars at rush hours. Single and double-truck part trailers. Storage battery at sub-stations.	
1a	Metropolitan (Holiday)	Pittsburg	60	8.5	1.66			Fourth of July.
2	Metropolitan	Detroit	55.8	10.9	1.79	15-25	450-460 cars max. Single-truck and high speed interurban. Battery at main and sub-stations.	
3	Interurban	Cleveland	56	100+	1.78	30-60	Double-truck. High speed. Cars. No battery.	
4	Rapid Transit (Elevated)	New York	60	9.7	1.67	40% at sub-stas	Multiple tunit rains. Six cars. Battery at sub-stations. 1337 cars max.	
5	Lighting	New York	47			Steady	Central and down-town district. Battery at sub-stations.	
6	Lighting	Pittsburg	65.8	2.26	1.52	Steady	Central and down-town district. Avg. day cloudy. No battery.	
6a	Lighting Max.	Pittsburg	46.7	4.85	2.14	Steady	Christmas, 1904.	
	Railways	Pittsburg	66	7.44	1.52	Fluct.	Week ending July 1st, 1905.	
	Lighting	Pittsburg	71.2	2.11	1.40	Steady	Week ending January 7th, 1905.	

\* Load Factor =  $\frac{\text{Average Load.}}{\text{Steady Max.}}$

TABLE No. II.—Appendix No. 2.  
SUMMARY OF RESULTS—PRODUCER GAS TESTS.  
U. S. Government, St. Louis, 1904-1905.

175 kw.—235 H. P. Producer Gas Plant—Belted—Full Load.						
Approximate Calorific Value Dry Fuel	14,000	13,000	12,000	11,000	10,000	Summary
No. of Tests.....	4	5	3	3	2	17
Avg. Length in Hours	17½	32¾	22½	23¾	23¾	25
<b>FUEL</b>						
Name .....	W. Va.	Ind. Ill. Ala. Ky. Ind. Ter.	Ind. Ill. Col.	Mont. N. D. Texas.	Wyo. and Texas.	U. S.
Character .....	*Bit. R. M.	Bit. R. M.	Bit. and Black Lig.	Lignite.	Bit. & Lig.	Bit. & Lig.
B. T. U. per lb. Dry.	14,501	13,225	12,667	11,425	10,792	12,854
B. T. U. per lb. Actual	14,223	12,303	10,942	8,242	8,458	11,346
<b>GAS</b>						
Yield cu. ft. per lb. dry	66.4	51.06	50.5	31.9	32.7	49.0
B. T. U. per cu. ft....	145.3	154.60	153.3	168.5	160.4	155.3
Producer Effcy.—% ..	65.4	64.90	70.8	65.9	62.1	65.9
<b>PLANT DUTY</b>						
Lbs. per BHP Hour, Actual .....	1.16	1.51	1.44	2.28	2.12	1.62
Lbs. per KWH, Actual	1.82	2.38	2.27	3.59	2.83	2.50
Lbs. per KWH, Dry ..	1.79	2.21	1.95	2.52	2.55	2.16
B. T. U. per BHP Hr., Actual.....	16,498	18,580	15,755	18,780	17,920	18,375
B. T. U. per KWH, Actual .....	28,890	29,295	24,838	29,600	23,915	28,350
B. T. U. per KWH, Dry .....	29,975	29,225	24,725	28,800	27,505	27,790

\*Bituminous run of mine.

TABLE No. IV.—Appendix No. 3.

## OPERATING COSTS.\*

London Metropolitan Boroughs.

Year Ending March 31st, 1904.

	Plant Cap'y k.w.	Output Sold	Ratio Sold Gen't'd %	Load Factor %	Operating Cost—d per K. W. H. sold.						
					Fuel	Supplies**	Labor	Repairs***	Works or Operating	Total, Incl Manage Exp	
Average of 11 Steam Plants.†	2,799	2,997,500	83.9	17.25	.597	.059	.214	.218	1.088	1.41	
Walthamstow...	810	1,019,326	80.0	15.45	.368	.152	.288	.048	0.856	1.05	
Savings% (in favor of gas).....					+38.4	† †	-13.5	+78	+21.5	+25.4	
Expense Items—% of Works Cost (Steam Plant) .....					55	5.4	19.6	20	100	129	
Expense Items—% of Works Cost (Gas Plant).....					43	17.8	33.6	5.6	100	123	

\* Data from "Electrical Times." Financial Reports.

\*\* Oil, waste, water and miscellaneous supplies.

\*\*\* Includes repairs to buildings, electrical equipment and distribution system.

† Steam Plants—Hackney, Stepney, Poplar, Battersea, Hammersmith, St. Pancras, Fulham, Shoreditch, Southwark, Hampstead, Islington.

†† Artesian well not in service. Water paid for.

TABLE No. V.—Appendix No. 4.

OPERATING COSTS—800 H. P. GAS POWER STATION,  
Bradford, Pa.

		1904	1903
Annual output.....	K. W. H.	804,092	780,000*
Station load factor.....	%	19.54	.....
Gas Consumption.....	cu. ft.	20,056,000	18,162,000
Plant duty (including heating).....	cu. ft. per K.W.H.	24.9	22.4
Average price of gas.....	cts. per M. cu. ft.	12.32	16.5

Operating Costs—Cents per K. W. H. Generated.

Fuel ( including heating ).....	0.307	0.384
Labor—Power station only.....	0.380	0.392
Supplies.....	0.059	0.072
Repairs—Engine and Electrical Equipment....	0.079	0.050
Repairs—Gas engines only.....	0.010	0.013
Total Works or operating cost.....	0.825	0.898

\* Estimated from nine months metered output.

Appendix No. 5.  
OPERATING COSTS—GAS POWER STATION.

Walthamstow District Council.  
From "Garcie's Manual."

**TABLE No. VI.**

Population—110,000. Supply commenced September 20th, 1901.

System—Three wire, D. C., 230-460 volts.

Capacity Station—2890 B. H. P.—2,000 kw.

Equipment:—

Gas Generators—8-Dowson-Anthracite.

Engines—4-115 B. H. P. Westinghouse 3 cylinder vertical.

3-250 " " " " "

6-280 " " " " "

Generators—Helios-Engine type.

Batteries—Tudor-2 x 254 cells-1000 amp. hr. capacity.

SUPPLY RECORD (Year ending March 31st.)	1904	1903
Number of lamps connected (16 c. p. equivalent)	21,000	16,070
K. W. Hrs. generated.....	1,019,326	659,796
K. W. Hrs. sold.....	814,187	542,423
Gross efficiency system.....%	80	82.25
Maximum load on feeders.....kw.	600	406
Average load on plant.....kw.	116.4	75.5
Load factor.....	15.45	15.25
Prices charged—lighting.....cts. per K. W. H.	8	8
(Discount) power.....	5-3	5-3

**FINANCIAL RESULT.**

	\$	\$
Capital expenditure..... to date	81,050	75,650
Land and buildings.....	198,000	179,600
Plant, engines, machinery.....	546,100	367,000
Total expenditure.....	63,000	48,380
Revenue..... Total	21,640	16,910
Costs..... "	41,360	31,470
Profit..... "	9.05	10.87
Profit..... % to average capital	2.66	3.20
Sinking Fund..... "	7.14	8.40
Average price obtained.....cts. per K. W. H.	38.46	40.9
Percent Working Cost to revenue from current		

**OPERATING COSTS.**

	Cts. per K. W. H.	Cts. per K. W. H.		
	Sold	Gen.	Sold	Gen.
Coal* and other fuel..... delivered	0.932	0.745	0.84	0.69
Oil, waste, water** and general supplies.....	0.383	0.306	0.46	0.37
Wages of workmen.....	0.738	0.590	0.82	0.67
Repairs and maintenance†..... Total	0.081	0.065	0.24	0.19
Total work cost.....	2.134	1.706	2.36	1.925
Distribution, public lamps, rent, management, taxes, insurance, etc.....	0.649	0.519	1.11	0.929
Total general costs.....	0.649	0.519	1.11	0.929

TOTAL COSTS.	2.783	2.225	3.47	2.854
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\* Cost of coal averaged \$6.50 per ton in 1902-3; \$6.75 in 1903-4.

\*\*Artesian well not yet in service; water purchased.

† Including buildings, mechanical and electrical equipments, storage batteries and distribution system.

## Appendix No. 6.

## COMPARATIVE ESTIMATES—GAS vs. STEAM PLANT.

Assumptions for Diagrams, Figs. 11 and 12.

GENERAL	GAS PLANT	STEAM PLANT
Rated capacity.....	5,000 kw.	
Character of load.....	Street Railway.	
Load curve.....	Figure 1-B. †	
Load factor average.....	66%.	
Maximum mean load.....	3,750 kw.	
Load fluctuation.....	10%—normal, 15%—light loads.	
Number of units (one spare)	Five 1,000 kw.	
Type.....	Horiz. tandem double acting, heavy duty.	Horiz. compound Cor- liss, condensing.
Overload capacity.....%	10	
Average load.....	2,611 kw.	
Daily output.....	62,668 K. W. H.	
Daily engine hours.....	75 $\frac{1}{2}$ .	
Average load on units.....	83% rating.	
HEAT CONSUMPTION.	10,000 B. T. U. per B. H. P. Hr.	14 lbs. steam per I. H. P. Hr.*
Overall efficiency unit.....	80.9%.	83.7%.
Auxiliaries.....	5%.	10%
Producer—efficiency.....	75%	
Boiler—efficiency (13,000 B. T. U. coal).....		60%
Plant duty, B. T. U. ....	23,275 per K. W. H.	42,900 per K. W. H.
Coal consumption.....	1.8 lbs. per K. W. H.	3.3 lbs. per K. W. H.
CAPITAL COST.		
Generating plant.....	\$ 77.20 per kw.	\$43.60 per kw.
Boiler—producer plant.....	25.06	27.50
Buildings, coal storage and switchboards.....	16.50	18.00
Total.....	\$118.76	\$89.10
Excess cost of gas plant...		\$29.66 = 30%.
WORKS OR OPERATING COST OF POWER.		CHARGED.
Fuel for all purposes.....		Pro rata.
Labor.....		
Supplies, including oil, waste, water, etc.....		Equal for gas or steam
Repairs (working repairs only, not betterments)		0.5 cts. per K. W. H.
FIXED OR CAPITAL COSTS		
Interest (6%).		
Insurance and taxes (2%)		
Depreciation (physical depreciation only).		
engine plant 6 $\frac{2}{3}$ %, boiler plant 7 $\frac{1}{2}$ %, producer plant 5%, buildings and switchboard 3%. Average for complete plants—gas 5.8%—steam 6.2%.		
Total cost of power comprises Works and Fixed Costs.		

\* Steam pressure 125 pounds, feed temperature 180° F., evaporation 8.1 pounds from  
and at 212° = 7.5 pounds actual.

† Curve based on actual load curve Fig. 1.

## APPENDIX NO. 7.

## WARREN AND JAMESTOWN STREET RAILWAY.

The Warren and Jamestown Railway is a high speed interurban road, approximately 21 miles in length, operating over a comparatively level and straight right of way between Warren, Pa., and Jamestown, N. Y., at the southern end of Lake Chautauqua. The population of the territory traversed is estimated at 50,000, with 11,000 tributary, not including a large summer population at the various lake resorts. Heavy high speed cars will be used, approximately 52 feet over all, with a normal seating capacity of 54 persons, each car being equipped with four A. C. 50 H. P. motors on 33-inch wheels. Four cars will be operated at present, with two additional cars later on.

Power will be generated at the power house now operated by the Warren Street Railway, at Stoneham, four miles south of the city. For some time gas engines of the vertical single acting type have been used for operating the present city railway system, and it is due to the general successful experience from gas power that gas engines will be used for operating the interurban road.

A noteworthy feature of the new interurban system is that Westinghouse single phase apparatus is used throughout, with 22,000 volts transmission and 3,300 volts on the trolley, which is of the Westinghouse catenary construction. A step-up transformer station is located at the power house and two step-down sub-stations about one mile distant from both Warren and Jamestown. These equipments contain transforming, switching and protective apparatus alone. As no direct current is used upon the system, it is impracticable to employ storage batteries, so that the generating equipment will thus be required to sustain at all times the entire demand. In the present city system a 150 ampere hour (one hour rating) storage battery is in use, which is kept floating on the line throughout the load fluctuations, to the relief of the gas engine equipment. In the new plant the gas engines must sustain both load and fluctuations without assistance. Each unit complete of the new equipment occupies a floor space of 20 x 47  $\frac{1}{2}$  feet, allowing 4 to 5-foot passageways, which is equivalent to 3.65 square feet per kw., or 1.9 square feet per H. P. capacity.

## DISCUSSION ON GAS ENGINE PAPERS.

Vice-President Beggs: Gentlemen, you have a paper before you, prepared by Mr. West and abstracted by Mr. Bibbins, likewise a paper prepared by Mr. Bibbins and just abstracted by him. I will say on behalf of the Association that it appreciates fully the work put upon the preparation of these papers, and there will be suitable resolutions prepared and embodied in the minutes of this meeting, to all the gentlemen who have prepared papers. These papers deal with matters of very great importance in the operation of our power plants. My own judgment is that in a few years many of us will be operating power-plants, the principal generating factor of which will be gas-engines, and I therefore trust that these papers will draw forth some discussion and inquiry. They are now before you, gentlemen.

Mr. C. O. Mailloux, New York City: The names of the two authors which appear on these papers are a sufficient guarantee of the merits of these papers. Mr. West was for many years engaged in the designing of steam engines of the Corliss type, and was considered, at the time he left the steam-engine field, if he has left it, one of the ablest authorities on the design of steam-engines, and, hence, in going to the work of designing gas-engines, he took with him a most valuable experience. I speak from personal knowledge of the man and of his work. Mr. Bibbins, if he has not made a life study, has certainly made a very long study of the gas-engine. He has been studying the gas-engine ever since it became a factor in the production of power, and has remained in close touch with it. Mr. Bibbins has the agreeable faculty of preparing intelligently and in digested form, suggestions which are of great value. He has published several papers of this kind, and has presented them to different bodies, and they all have a great deal of merit.

There is too much meat in this paper to be discussed in the time at our disposal, but I want to call attention to one

very interesting circumstance which shows in itself the progress the gas-engine is making. At the last convention there was a reference to the subject of gas-engines, and I took part in the discussion. I called attention last year to the fact that, with the data which we had and the investigations which had been made, the evidence went to show that the two lines of the diagram of comparative costs crossed at a value of coal corresponding to about \$2 or more, per ton. This meant that for any value of coal corresponding to about \$2 per ton, the two systems, the steam-plant and the gas-plant, were about equal. This year Mr. Bibbins gives us a diagram where these two lines cross at \$1 per ton. This is a very significant fact, if both diagrams are on the same basis. It shows that the cost of the gas-engine power must have been greatly reduced in some way. Either that has been brought about by reducing the cost of the machinery itself, or the cost of its maintenance, or by increasing its efficiency. It would be very interesting, in fact I consider it the most interesting feature of the entire paper, if Mr. Bibbins will give us, out of the vast fund of knowledge which we know he has, some clue as to the reasons which have brought about that result. If this keeps on, at another convention we may reasonably expect to find that these two lines will start at zero and cross at some point near zero in the cost of coal. That will mean that we cannot afford to use gas-engines at any price of coal above a few cents per ton.

The line representing the cost of power by gas-engines has also been flattened; it makes a smaller angle than before. While in most systems a lessening of expense is largely due to reduction in initial cost of equipment, to better methods of manufacture, and to simplification of the apparatus itself, yet I am interested in knowing whether the increased efficiency of the engine, the reduction of repairs and maintenance, may not have had a great share in reducing that cost?

Mr. J. R. Bibbins: Does Mr. Mailloux refer to a similar diagram in a paper presented to the Ohio Gas Light Association this year?

Mr. C. O. Mailloux: At the last convention of this Association, I referred to a lecture on this subject by Mr. Ralph D. Mershon, before the New York Electrical Society.

Mr. Bibbins: I am not familiar with Mr. Mershon's assumptions, but I am inclined to think that he worked up that diagram for an electric lighting plant where the load factor on the system is barely 25 percent, usually lower than that. Referring to my assumptions in the Table of Estimates in the last part of the paper, you will find that I have taken the load factor corresponding to an average large railway plant, 66 percent. That is an important factor in determining the exact crossing of these two cost lines. I am not familiar with the prices which Mr. Mershon used in preparing his diagram. The costs I have used are also shown in the estimate, and they are quite recent.

You will notice on the diagram that the lowest pair of diagonals refers to the cost of fuel only. There, of course, the gas plant has a great advantage. The second pair of diagonals represents the total cost of operating, including cost of fuel. I have estimated the operating cost items, labor, supplies and repairs, at 0.5 cents per k. w. hour. For lack of absolutely definite information, I was obliged to take the same figures for both plants, but I have already shown you (in the case of Walthamstow) that it is very possible in the case of the gas plant that these items may be much less.

Mr. Mailloux: The estimate of 1-5 cent is high, I believe.

Mr. Bibbins: It is rather high, I admit, but, as it is on the conservative side and I have taken the same figure for both stations, the comparison is not unfair. The upper pair of diagonals takes into account all fixed charges and represents true total cost.

I desire to point out that the present cost of anthracite coal brings this fuel well within the range of power plants generally; for instance, we may obtain at Cleveland or Buffalo,

which are comparatively central points, pea anthracite coal at \$3.12 per ton, No. 1 buckwheat is \$2.45 per ton, and No. 2 buckwheat is \$2.00 per ton. You can see that these figures bring the anthracite producer plant well within the range of ordinary practice. Where plants are located in the bituminous field, or adjacent thereto, there will be no question as to the superior economy of bituminous plants.

Mr. Charles Hewitt, Philadelphia: I well appreciate the difficulty of preparing diagrams, such as this, and I have reference now to the diagram, Fig. 10, but I don't think we should accept these curves without question, and comment. I am not prepared to question Mr. Bibbins' line of cost for the gas-plant, but the line showing the cost per k. w. hour for the steam-plant seems to me open to question. It at best represents a very uneconomical plant. Anthracite buckwheat coal runs between 11,000 and 12,000 heat units per pound of coal. If you will follow these figures up on this diagram, you will see that they make the consumption about 7 lbs. per k. w. hour. The poorest plant I am familiar with shows better results than that. Good non-condensing plants run on an average of 4.5 lbs. per k. w. hour, while condensing plants can be run on 3.5 lbs. The saving in coal in the gas-plant is sufficiently large, it seems to me, without magnifying it, and without putting a curve in the diagram which shows an abnormally inefficient steam plant.

Referring now to this table, which Mr. Mailloux referred to under operating cost only, you will see the effect in a similar manner. The difference between the cost of operating the steam-plant and the gas-plant, is somewhat magnified. Taking coal at \$2.50 per ton, and following that up to the line showing the cost of the steam plant, it brings the cost of operating that plant over 9 mills per k. w. hour. There are plants running at 6 mills with buckwheat anthracite coal, including all operating costs, but not the interest on the plant. The cost for steam is too high for a well designed station, and, there-

fore, the difference between the two lines, assuming the cost for the gas-plant is correct, is unduly large.

Mr. Bibbins: The records of the British power plants are uniformly expressed in "works cost" which we call operating cost. That includes the four items, fuel, supplies, labor and repairs, without any fixed charges of management expenses. British "total cost" includes management expenses and operating expenses only. You will note that this table is expressed in pence, instead of in cents, and, therefore, the costs as I have quoted them on the platform were in cents, 2.8 cents total, or 2.2 cents operating. In the last two lines of the table I have shown the distribution of expenses in works cost, taking the latter at 100 percent. The management expenses increased the works cost by about 29 percent in the case of steam and 23 percent in the case of gas.

As regards Fig. 10, I was apprehensive that it would be misinterpreted, and, therefore took pains to mention that it referred to a non-condensing steam plant. The two test equipments at St. Louis consisted of a 3-cylinder vertical gas engine, belted to a generator and a Corliss engine unit of similar capacity. You could not expect to obtain the same economy out of these two plants as out of a large central station. Although the results are comparable (bearing in mind that a non-condensing steam plant was used) both equipments were of small size, which really makes the results obtained the more remarkable. I think it would be safe to say that the relative coal consumption between steam and gas plants of similar character would be about 2 to 1. In the present case, the ratio is much higher.

Mr. Charles Hewitt: I did not raise any special question about the curves, except to state that the steam plant line is too high. An intermediate line, it seems to me, would be a fairer average line for stations running with anthracite coal.

Mr. Bibbins: Assuming 4.5 pounds of coal at the calorific value quoted by Mr. Hewitt, 11,000, the comparative

efficiencies would be in about the ratio mentioned, 2 to 1. It will be noticed on the preceding page the results from the Walthamstow station, that the average consumption was only  $1\frac{3}{4}$  pounds of coal during the year for anthracite coal, including extra coke for banking and raising the steam required to blow the producer.

As to the diagram showing the comparative costs of steam and gas, I have probably erred in the matter of assigning a cost as high as .5 of a cent for the three items, labor, supplies and repairs. That, however, does not affect the relation between the two plants as previously explained, and I preferred to assign an equal value in order that any particular quantity might be applied by any one from their own data. It is apparent that if any advantage could be obtained in a gas plant, as at Walthamstow, the power gas cost line would be lower, and, consequently, the intersection of the two would indicate the cheaper grades of coal.

Mr. C. O. Mailloux: Is Mr. Bibbins able to give us any information as to whether a change in the size of the plant would have much effect on the relative arrangement of these lines? We know that in steam-operated plants the aggregate cost does not change very much, but the distribution of the cost changes. The question arises whether a similar process takes place in the case of plants which are considerably smaller than 5,000 k. w.-units, or considerably larger.

Mr. Bibbins: That is a difficult question to answer definitely offhand. There is one point which has some bearing on it; the fact that the gas engine does not vary greatly in efficiency for a wide variation in size; that is to say, the small engine will show an efficiency quite comparable with the large one, and therefore, the choice of the larger engine is determined mainly by the capacity necessary in the plant with such sized units as to secure the highest running economy under load conditions. I do not see any reason for the change in the relative cost of these various items in the smaller plant,

provided the same number of units were used. The number of units has, of course, an important bearing on the operating cost, particularly as regards labor and repairs.

Mr. C. O. Mailloux: I do not think the question is fully answered. I was going to add to my previous remarks, that the question of cost of installation, it seems to me, has quite an important bearing on the upper line of total costs, and I would presume that the smaller plant would have a higher cost per k w-unit than the larger plant, as we find to be the case with steam-plants, at least, within certain limits. In this connection I would like to ask Mr. Bibbins to give us information also as to the question whether the cost per k w has not been considerably reduced within the last year?

Mr. Bibbins: I agree with Mr. Mailloux. The smaller plant would cost more per k w even though the same number of units were installed, but at the same time the relative ineconomy of steam plants will increase much more rapidly with smaller units which might readily more than balance the increased capital cost of gas plants. In smaller sizes the producer is a much more efficient piece of apparatus than the boiler, and the same is true with the engine, although it is impossible to tell whether the same relation will hold.

I do not believe that I am in a position to give Mr. Mailloux any accurate data offhand as to how much the cost of gas-engines has been reduced within recent years. I have already mentioned on the floor that a special type of generator for gas-engine work was about to be introduced which would place the engine and generator more nearly upon the same basis of rating, and, incidentally, reduce the cost of the complete unit. On the present basis of rating the gas-engine has a normal overload capacity of about 10 percent, whereas the generator can sustain a continuous overload of 25 percent within the normal temperature rise. Furthermore, on sudden overloads the capacity of the generator may be easily 50 percent. above its normal rating, whereas the overload capacity

of the gas-engine is limited, as has been previously pointed out. The two elements of the complete unit, engine and generator, can thus be brought more nearly to an equal basis of rating by discarding the 15 percent excess overload capacity of the generator, while still maintaining the present basis of temperature rise. This will simply result in a smaller generator, and, obviously, a reduction of its cost also.

Mr. Mailloux: I did not want information as to the cost of making, but as to the cost of selling.

Mr. Chairman, I would suggest that Mr. L. C. Marburg of the Allis-Chalmers Co., be given the floor.

Vice-President Beggs: We will be glad to hear from Mr. Marburg.

Mr. L. C. Marburg, Milwaukee: With regard to Table No. 7, I would inquire if the overload capacities have been taken into account in comparing the relative cost of steam-engines and gas-engines. From the price for the steam-engine plant, it is evident that a reciprocating steam-engine could be obtained which would have 50 to 100 percent overload capacity momentarily. I understand from Mr. Bibbins the way he rated the gas-engine is on a basis of 10 percent overload capacity only. This might explain the point brought up by Mr. Mailloux, as to the relative cost per *k w* of steam and gas-engines given in the paper.

Mr. Bibbins: The gas-engine units mentioned in Table VII. were rated at 25 percent continuous overload capacity as also were the steam units. The steam-engine by itself, of course, has a greater overload capacity, but the rating of the complete unit is nevertheless dependent upon the generator in either case.

Mr. Marburg: That naturally would explain why on your curves giving the relative costs of operation of steam-engine plant and gas-engine plant, the advantage is in favor of the gas-engine, at such a low cost of coal.

Mr. Bibbins: Mr. Marburg probably misunderstands the

matter. The Table VII. applies to the tenders for the European plant, and has no bearing on these diagrams, Figs. 11 and 12. These were prepared from the estimates shown in Appendix VI. at the end of the paper, where the costs of the two plants are given.

Mr. Marburg: On the table a price of \$40 per brake h.p. is given. It would naturally be of interest to know what the overload capacity is.

Mr. Bibbins: The basis of overload capacity in the case of the gas-engines was taken as 10 percent. It is, of course, possible in the same way to assign an overload rating to a steam engine. As is usually the case the steam engine is rated at such capacity that it will give its best economy at about  $\frac{3}{4}$  load, as I have assumed. But, if we rate the engine at 10 percent below its maximum, the steam consumption would evidently be much higher, although fixed charges might be considerably reduced. The whole question comes down to this: if you increase the rating of your steam-engine, you increase the steam consumption very largely at the average operating load, so that the short cut-off is incidentally necessary to secure ordinary operating economy. After all, the generator is the limiting factor in the equation.

Chairman Beggs: Would not the steam cost be reduced?

Mr. Bibbins: The fixed cost would be considerably reduced, but the operating expenses would be greatly increased.

Mr. Marburg: It would seem impossible to obtain a load factor of 66 percent if the overload capacity of the machine is so small. That is a good load factor for a reciprocating steam engine.

Mr. Bibbins: Load factor is a characteristic of a station service, not of the prime mover, so that the overload capacity of the gas-engine is only an incidental factor.

Mr. Mailloux: The point which Mr. Bibbins makes, it seems to me, is influenced largely by the form of steam motor used and its efficiency curve. One can see at once that it would

be quite different in the case of steam turbines, which have notoriously flat efficiency curves. It seems to me if the comparison were made with the steam turbine he would find, in the first place, that the line of cost for steam power would be much flatter, have a smaller angle than it now has, and, in the second place, that the cost would come further up. In the case of the comparison with the gas plant, predicted as the basis of the calculations of the steam turbine plant, the line at which the two would cross would be more nearly at \$2.

Mr. Bibbins: Do I understand you are assuming only 10 percent overload in the two cases?

Mr. Mailloux: I do not think that it would be necessary to make the assumption in the case of the steam turbine, because the efficiency curve is so nearly flat for three-quarters of its range. You would not meet that condition. If you did assume the normal capacity to be within 10 percent of the "stalling" load, the comparison would be more favorable to the turbine, and would force the point of intersection between the two curves at some point at least as high as \$2 per ton.

Mr. Mailloux: Mr. Chairman, I suggest that Mr. W. E. Windship be given the privilege of the floor to participate in this discussion.

Mr. W. E. Winship: I think I can add a few figures pertinent to the discussion, based on a gas-engine plant which has been operated about one and a-half years. We installed at the Gould Coupler Company's works at Depew, N. Y., three Westinghouse vertical engines rated at 235 brake h.p. each, together with a Loomis-Pettibone gas producer system. The plant cost approximately \$115 per brake h.p. to install. We estimated that it would have cost \$90 per h.p. for a steam plant equivalent to the gas plant except as regards coal consumption and overload capacity. We are installing a storage battery and we will thereby have a somewhat greater overload capacity than that of the steam plant above mentioned. After

the battery is installed the plant will have cost \$130 per brake h.p.

Our coal consumptions based on coal containing 13,400 b.t.u. per lb. have been on a monthly average 2.26 lbs. per k w hr. on the switchboard, with an average load factor of roughly, 50 percent for 24 hours operation. On a series of days when our engines were operated at approximately 64 or 65 percent of their rated load, the coal consumption went down to 2.02 lbs. as an average of the days when that condition existed. The lowest record for a 24-hour period of operation, when the load was especially good, was 1.79 lbs. of coal per k w hr. on the switchboard. Our load is very similar to that occurring in street railway work. The peaks, when the load is heavy, are fully 60 percent. above the average, and when the load is lighter, they are fully 100 percent. above the average. Our conclusions are that with coal at \$2.30 a ton, if we operated our plant for about 14 to 16 hours a day, a steam-plant and the gas-plant would have just balanced each other taking fixed charges at 12½ percent. in both plants. As we operate 24 hours per day we find the gas plant a paying investment and shall develop along that line. The engines have proved to be perfectly reliable. During the noon hour and at midnight we have the opportunity of shutting down one or two engines for half an hour which allows us to change igniters if necessary.

In regard to trouble with exhaust valves, we have only ground in our valves once in all the engines, with the exception of one valve, which has been ground in twice.

There is a criticism to be made in regard to the ignition of all gas-engines, especially where electric ignition is used. Some means should be provided for changing the igniters when the engines are in operation even if the igniters are double. I do not know of any engine in which this is provided for. Another need is for some ready indicating instrument for determining the heat contents of the gas. Of course, there are calorimeters by which the heat contents of the gas may be

determined, but there is no rough and ready indicating instrument to put in the gas producer house. This need is especially pronounced in bituminous gas plants, where the color of the flame does not give any idea as to the heat contents of the gas. It does not seem to be such a hard problem but that such an instrument could be designed and it would certainly be an advantage in locating trouble.

Mr. Charles Hewitt: It may interest some of the members to know the latest results in steam turbine plants, which I received only a few weeks ago from New England. As opposed to the 2.26 lbs. of coal which Mr. Winship gave as the average of thirty days, the results show 2.24 lbs. to 2.6 lbs. per k w hr. with bituminous coal. The average is 2.5 lbs. for turbines, as against 2 $\frac{1}{4}$  lbs. for gas engines. One of these plants has five units of about 1,000 k w; the other has two units and I think there are about 1,500 k w using superheated steam.

Mr. Bibbins: In these comparisons, it is, of course, necessary to bear in mind that the two plants widely differ in character, capacity and load: One, a 5,000 k w turbine plant on a presumably fairly steady load; the other, a 450 k w gas plant on a severely fluctuating manufacturing load. In regard to changing igniters while the engine is running, there is a system used on Westinghouse engines which makes it possible to accomplish this result. For instances, in the fire station at Philadelphia, each cylinder is equipped with a double igniter plug having two sets of contacts. Either one may be thrown in or out by a small switch conveniently situated. There are four independent sources of current for supplying the igniters, and, as each cylinder is provided with a double set of igniters, current may be supplied by eight combinations. If one of the igniters gets into trouble the other can be quickly cut in and prevent loss of power.

Chairman Beggs: Are there any further questions or remarks concerning this paper? If not, we will receive the report of the Committee on Nominations.

## REPORT OF THE COMMITTEE ON NOMINATIONS.

Mr. Parsons, the chairman of the Committee to nominate officers for the ensuing year, is required to leave, and we will now receive the report.

Mr. John B. Parsons: The Committee appointed for the purpose of nominating officers for the ensuing year is now ready to report. They present the following nominations:

President—W. Caryl Ely, Buffalo, N. Y.

First Vice President—John I. Beggs, Milwaukee, Wis.

Second Vice President—Calvin G. Goodrich, Minneapolis, Minn.

Third Vice President—James F. Shaw, Boston, Mass.

Chairman Jones: Gentlemen, the report of the Nominating Committee is before the Association. What is the pleasure of the Association in regard to it?

Mr. W. Worth Bean: I move that the report of the Committee be accepted and the secretary authorized to cast a ballot for the gentlemen who have been nominated. (The motion was carried, the ballot cast, and the chairman declared the nominees elected.) In response to calls for a "speech,"

President Ely said: Gentlemen, if I should say that your action is not pleasing to me personally, to my mind, to my feelings, I would not be telling the truth; but when I say to you that I have devoted a great deal of time to these matters for the last year, and a very considerable amount of time the year before, and that I can see that there is a whole lot of work to be done during the coming year, to commence this afternoon or tomorrow morning, and that I think you should have selected some other person to have gone ahead at this time, for several reasons, then I would be telling the truth also. I have grave doubts—and have expressed them to my friends who have come to me and said very nice and pleasant things about my work in the Association, whether it was wise to elect me at this time, and that I thought they should put a new man in this office. We have agreed upon a form of organization.

I believe there are a lot of men available from among whom a selection could have been made of a President for the ensuing year, but it seems to me that I am caught "with the goods on" and cannot get away, and of course, I will stand.

There is a great deal of work to be done, and our plans cannot succeed unless hard work is put upon them, and unless that work is participated in by all the leading members of the Association. Everybody in the Association must be called on to co-operate. I believe if they do co-operate, that the thing which will result in a couple of years will be so big and so useful to everybody, that the common sense of all will say—"Why didn't we inaugurate that ten or twelve years ago? What were we thinking of?"

This is a great honor you have conferred upon me. Whether a man has time to do it or not, without serious embarrassment to himself, coming in the way it does, it is a virtual demand for me to accept the duties of the office. I will perform them to the best of my ability; and with your assistance trust that we may produce the result we hope for. I wish to repeat again that I appreciate the election as a very great honor. (Applause).

Mr. John I. Beggs: I wish to say a word of approval of the action of the Nominating Committee in the selection of Mr. Ely. As many of you know, there were a number of gentlemen who, in their kindness of heart, approached me with the idea that I should be made President of this Association. I took the position that the incumbent of the Presidential office in this Association should not be changed at this juncture; that the future of this Association depended largely upon the work that has been under consideration and under discussion for the past three years and should be largely left in the hands of the head of the Association who has been so intimately connected with it.

I appreciate fully, Mr. President, the burdens you are assuming, and I desire to pledge to this Association the best

efforts I can give towards its advancement. I do not know whether Mr. Goodrich is present or not, but I am glad that he has been continued as a Vice President of this Association, that those who are coming into office are familiar with what was intended to be accomplished under the new form of Constitution and By-Laws. (Applause).

President Ely: Gentlemen, the choice the Nominating Committee made of First, Second and Third Vice Presidents is certainly an admirable one. I know from the talks I have had with Mr. Goodrich that he is very much interested in this work. We know that Mr. Beggs means what he just said, that he will assist our work to the best of his ability, and we know from experience how wise, how able, how earnestly, how hard, and how effectively he works. It is a great thing for the organization to have services like his put at its disposal. It is worth money to anybody to have John I. Beggs working for him. Mr. Goodrich is a very able man and a splendid organizer, and from the talks I have had with him during the past year, I know that his heart is in this work. I know Mr. Shaw's feelings in the matter. Although he was not a member of the committee, he has come upon my invitation several times, leaving his work when he should be at home; and I think the members can rest assured that, so far as the officers you have elected are concerned, the affairs of the Association will be taken hold of in a way that will set things humming.

There are outside of the official personnel of the organization a number of gentlemen who are very much interested in this work, men who have been, during the past year, often called upon and who have given very freely of their time and made most valuable suggestions. At some proper time there should be some recognition taken of them, because their assistance has been very valuable and has largely influenced the action which we have taken in this matter. As you all know, probably, there are moments when a man is working along lines like this, when the question comes to his mind:—Are we

getting to be cranks? Are we taking a wrong course in this matter? Is it possible the result is not going to be what we think it will be? and a whole lot of doubts and questions like that arise in a man's mind. I have been greatly strengthened and bolstered up in my judgment during the past twenty-four months by the suggestions and the expressions of men who are notable in the world of railway achievement, and I want to mention one to you. Yesterday I was at luncheon downstairs with Dr. Wilson, the President of the Commercial Museum here, which, by the way, is a great institution and ought to be examined by you as business men before you leave here. This is the way the Germans educate their business men. They take a fellow by the neck in Germany and educate him for fifteen years and train him for business. The Philadelphia Commercial Museum is patterned after the German Museums, of which there are upwards of sixty, supported by the German Government, all reporting to the Minister of Commerce. Dr. Wilson kindly invited Mr. Theodore N. Ely, who has charge of the entire motive power of the Pennsylvania Railroad. There was a short talk between us and Mr. Ely drew forth from me a short statement of what we were doing, and then, in less than ten minutes, he who has been for years a member of the Executive Committee of the American Railway Association and of different engineering societies, outlined what he thought, as a rough suggestion and quick thought, we should have, and what he said will prove of immeasurable value to us. If he had been reading our proposed form of re-organization carefully, he could not have sketched an outline of it much better than he did. Some suggestions on other lines which he threw out were very pleasing to me at that particular moment. Mr. Ely further said that there was no question in the minds of the men who today are directing the greatest railway systems that the work of the Master Mechanics Association and the Master Car Builders Association and the different organizations that take part in street railroad

work, has been of immeasurable value to the steam railroads and has put forward by years the time of the arrival at the present standard of steam railroad work. He said further to me that the wisest man, the man who can look forward farthest today, can see but a short distance and can form but a faint impression of the work in which we are engaged; that the question of electrical development is occupying and engrossing the attention of the foremost men in steam railroad work, and he augured great good to this branch of the railroad industry from this organization.

If we work hard, work wisely and well, take good advice and follow it, and all will co-operate, I believe that, in a very short time, we can make an amazingly long stride in putting this Association on the footing upon which it should be. (Applause.)

Chairman Beggs: We will now take a recess until 2 o'clock.

#### *THURSDAY AFTERNOON SESSION.*

President Ely called the meeting to order at 2:15 o'clock.

President Ely: The first business of the session will be the reading of the paper on "The Single-Phase Railway System," by Mr. Charles F. Scott, of Pittsburg.

Mr. Scott then presented his paper as follows:

#### **THE SINGLE-PHASE RAILWAY SYSTEM.**

To the American Street Railway Association—

Gentlemen:

It is the purpose of this paper to present some of the salient features of the single-phase railway system, and the results of the work which has been accomplished in the development of apparatus to meet the increasing demands in electric traction.

The questions which a railway manager is apt to raise with regard to the single-phase railway concern are its suitability for his particular conditions, its present practical status and its cost. The answers which apply in one case may be misleading in others, so that the discussion of the subject must be general rather than particular.

There are two other questions which have been asked so often that they deserve a passing comment: Will the motor start with good torque and accelerate rapidly? Will it commutate? Suffice it to say that the single-phase motor of the variety which I am considering does start and accelerate and commutate.

It is not the motor itself, but the single-phase system which the motor makes possible that is of prime importance. And the system is of commercial value only as it is able to operate electric railway service more effectively and economically than is practicable by other means.

#### SINGLE-PHASE AND DIRECT CURRENT SYSTEMS COMPARED.

The single-phase system accomplishes the same results in car movement that may be obtained by direct current equipments, but in many cases with less first cost, less operating expense, increased flexibility and great simplicity.

The radical difference between railway systems using direct current motors and those using single-phase motors is not so much in the car or the power house as it is in the circuits connecting them. In the first place, the high voltage used on the trolley wire does away with expensive feeders and it also enables the current to be carried to a greater distance from the power house or from the sub-station. Second, the sub-station employed in the single-phase system requires simply a lowering transformer. The sub-station for supplying a direct current railway requires the rotary converter and a set of lowering transformers. Third, the number of sub-stations for a single-phase road is less than is required for direct current, and these do not require the attendance which is necessary for the operation of rotary converters. It is these characteristics that peculiarly adapt the single-phase system to interurban and long-distance railways.

#### CONSTITUENT PARTS OF SINGLE-PHASE SYSTEM.

The motor is the feature which has received particular interest and comment, for it has been conceded that if a single-phase motor be available the other elements would follow as a matter of course. No one has questioned the adaptability of control apparatus, transformers and high tension line construction to the requirements of the single-phase railway system. This simply involves the application of well-known apparatus and methods to the particular requirements of railway operation. But a perfected motor does not mark the completion of development work. Control apparatus for handling alternating current must be devised

and constructed. It must be suitable for hand control for small cars and it must be adapted for the multiple unit operation of heavier equipments. Still other forms must be suitable for operation interchangeably on either direct or alternating current. Transformers, line switches and other auxiliaries must all be combined into a workable equipment. Forms of trolley and overhead construction must be developed suitable for the new conditions of current and voltage. The announcement of a commercial single-phase motor, made in the paper of Mr. Lamme before the American Institute of Electrical Engineers three years ago this month, was necessarily the beginning rather than the end of the development of the system as a whole in all its details.

#### ADVANTAGES PROVED BY SERVICE.

In how far have the advantages claimed for the single-phase system been realized? Among the important features are the following:

A high voltage trolley construction has been developed and has proved to be simple, strong and thoroughly practicable. Thirty-three hundred volts have been used and have proved to be safe and reliable.

A sliding contact device which does not require reversing when the direction of the car is changed is found more satisfactory, especially for high speed operation, than the trolley wheel. Its wearing surface lasts longer than trolley wheels operating lighter cars on direct current.

Transformer sub-stations supply current satisfactorily without feeders and without station attendants.

The car equipments show simplicity and effectiveness in the control apparatus. Less than half the controller notches required for direct current give equally smooth and as rapid acceleration with alternating current. Platform controllers are simpler, as no magnetic blow-out is required. The multiple unit control system is readily adapted for the operation of single-phase motors and is in some points simpler than the control of direct current motors.

The operation interchangeably by alternating current and by direct current is a feature of an important road which operates large equipments on direct current in the city and on alternating currents across the country.

Motors of four or five sizes have been built and show excellent commutating features. The commutators take a good polish. The motor windings are such that there is a practically balanced magnetic pull, even if the armature be slightly out of

center. Although the armature speed is higher than in corresponding direct current motors, the advance criticism has proved ill founded, as there have been no bearing troubles. The oil lubrication has proved highly satisfactory.

The foregoing features, which are the important elements upon which the claims of the single-phase system are based, have been shown by actual operation to be entirely feasible and practicable and such as to inspire confidence.

Difficulties have been met which have been annoying and vexatious. The difficulties, however, have usually been due to some error in the general engineering features or to some specific point of weakness in the insulation or construction of some part of the apparatus. In other words, the troubles have not been fundamental and inherent in the single-phase system, but have been incidental and capable of ready remedy. Some particular difficulties will be taken up further on in this paper.

#### LEADING FEATURES OF THE SINGLE-PHASE SYSTEM.

As a guide to determine the conditions under which the adoption of the single-phase system is advantageous it will be useful to review briefly some of its features which are particularly concerned in its installation and operation.

**The Motor**—A motor which is protected from the trolley voltage and lightning disturbances by an intervening transformer winding, which has only 200 to 250 volts across its terminals, which may have its brushes grounded or short-circuited without "flashing" or "bucking," and which may have full voltage thrown on its terminals without disaster to itself, is essentially a safe motor. The armature has a bar winding on sizes of 30 horse power and upward. The increased current required at low voltage necessitates brush capacity equivalent to that on a direct current motor of twice the output.

**The Control**—One usually thinks of the direct current street railway motor as a variable speed motor. Yet it is, in a sense, fundamentally a one-speed motor, for with definite trolley voltage, weight of car and grade, the motor soon attains a definite speed, at which it continues to run until there is a change either in the voltage applied or in the load. If two motors be operated in series there is a second definite speed, which is about half of the speed when they are in parallel. Other speeds are obtained by lowering the voltage on the motor by means of resistance, but this is inefficient and is admissible only in starting.

Certain results follow. The speed of the car depends upon the trolley voltage. If the voltage be low, the speed is low. The efficient speeds are fixed by the trolley pressure and not by the motorman. The relation between speed on level and the speed on grade is fixed by the inherent characteristics of the motor. A given motor with definite gear ratio has its one definite speed depending upon train resistance and electro-motive-force. There is no range of adjustment like the throttling of an engine without the introduction of the wasteful rheostat. In a series motor the current determines the torque and the electro-motive-force determines the speed. Hence, for speed control there must be voltage control. In the direct current system efficient voltage control is not attainable, but with alternating current it is easily secured. The simplest method of varying voltage is by means of taps from the transformer winding. The low voltage required for starting is obtained from a low tap and the successively higher voltages for the increasing speeds are secured from successively higher taps from the winding. As there is no rheostat, the motor may run efficiently from any tap, thereby giving the motorman a control over his car movement which is not possible with direct current. If there be a tap giving voltage higher than that required for normal running, it is available for giving a higher speed for making up lost time, or for supplying normal voltage to the motor when the line pressure is low. The car can run at any time at the pressure needed.

The number of points required on the controller for smooth acceleration is much less with alternating than with direct current. The whole control system, in fact, is simply half a dozen taps from the transformer to the controller, by means of which any one of them may be connected to the motor. An intervening preventive coil enables the controller to pass from one point to the next without opening the circuit or short-circuiting the two taps. The controller may consist of a drum of ordinary form on the car platform or of unit switches placed under the car and operated by a master controller. The latter type is used in heavy equipments and also when several cars are to be operated in the multiple unit system. An effective form of switch with magnetic blow-out has been developed for heavy currents. The switches are assembled in a compact group, thoroughly protected and easily accessible.

**Trolley Voltage**—Twenty years ago the electric railways of the United States, as measured either in miles, in cars or in kilo-

watts, comprised less than 1 percent of what they do today. In this enormous rapid growth two features of the electric railway have remained unchanged, although other elements have been greatly modified. These two features are: First, the series motor; second, the use of direct current at approximately 500 volts. During this time the generating plant has changed from small belt-driven to large direct connected units and then from direct current to alternating current. High tension transmission circuits with rotary converter sub-stations have been common. Motors have increased in size and have been improved in design and in reliability and the multiple unit system of control has been introduced for larger equipment. The trolley voltage, however, has been limited to approximately 500 volts on account of the limitations of the direct current motor and the inability to transform direct current on the car from a high voltage to a low voltage. The general trend of electrical engineering has been toward alternating current at high voltage. Many can remember the time when the use of 1,000 or 2,000 volts was decried as impracticable or unsafe and when 5,000 or 10,000 volts was the limit to laboratory experiments. Progress has been made in design, in construction and materials until voltages which not long since were impracticable, are now operated with greater reliability and safety than were the lower pressures a few years ago. Safety is very largely a question of mechanical excellence. In railway motors and control apparatus, in the mechanical equipment of heavy and high speed cars, in overhead construction and in power house equipment, reliability is primarily dependent upon mechanical excellence.

While any considerable increase in voltage may not be safe on existing trolley lines, it is practicable by an increase in mechanical strength to offset the higher pressure and produce a high voltage trolley system of far greater reliability and safety than the present construction for low voltage affords. Such a construction has been developed into a commercial form in the catenary suspension of the trolley wire. An auxiliary steel cable with a moderate sag at the center of spans supports at frequent intervals the trolley wire which is thereby maintained at a uniform height. It is adapted for high speed running and it possesses a greatly increased strength. The excess cost of the catenary construction over the cost of poles and overhead construction of the ordinary type is moderate, and, in a large meas-

ure, is justified by the gain in mechanical reliability quite aside from the question of voltage.

**The Sub-Station**—To one familiar with an ordinary rotary converter sub-station interest will center chiefly in the negative characteristics of the single-phase sub-station. There is no rotary converter—a most essential link in the old system, one which behaves remarkably well when all is favorable but inclined to be fussy and obstreperous when the conditions are not to its liking. There is no synchronizing, no sparking, no flashing, no dropping out of step. The transformers are not arranged in banks of two or three little ones, with polyphase switches and auxiliaries in primary and secondary, and the direct current switchboard has disappeared entirely.

So much for what is not. In its simplest form the sub-station is a single transformer with its primary and secondary connections. Additional transformers, switches, lightning protection and instruments are added as circumstances require.

Short-circuits have lost much of the terror. The alternating current on short-circuit is limited by the self-induction of the circuit, and a transformer is not disturbed by a "short" as is the commutator and the speed of a rotary converter.

The difference in the effect of a short-circuit on direct current and on alternating current is well illustrated in the underground circuits in New York City. In an 11,000 volt cable system a fault in the cable causing a short-circuit is usually confined within the cable and merely burns out a few inches of the conductor before the circuit-breaker opens. On a low tension system, however, the currents are very large and considerable lengths of the conductor may be melted before the current is interrupted. In an alternating current system the normal current in a circuit delivering a given amount of power is less in proportion as the voltage is increased, and, as the increase of current above normal is not as great on account of the self-induction of the circuits and apparatus, accidents are less liable to be destructive.

#### OPERATION ON DIRECT CURRENT.

If the single-phase road is to be an extension of an existing road it may be desirable to run the single-phase cars over the tracks which have a direct current trolley wire. While single-phase cars can be arranged to operate from a direct current trolley wire, it handicaps in some measure the single-phase equipment. The addition of resistance to the car equipment

and the extra switches and the like for enabling the change to be made in the current supply are obviously objectionable. It is best, therefore, to keep single-phase equipments free from operation on direct current if it be practicable to do so. When it is found necessary for them to operate from an existing direct current trolley wire, the motors are connected two in series for 500 volts, and if there be four motors the two pairs may be connected first in series and then in parallel as in ordinary series parallel control. The transformer is cut out, and the control apparatus and motors operate substantially the same way as those on an ordinary car.

#### SOURCE OF POWER.

The standard frequency for the single-phase motor is 25 cycles, (3,000 alternations). Generators may be wound for single-phase, or current may be taken from one phase of a two-phase or a three-phase generator. Current from the several phases of a polyphase generator may be used for operating different divisions of the railway.

If power is to be taken from a power house which generates a higher frequency it cannot be applied directly but must be changed to 25 cycles. This may be effected by a motor generator set. A polyphase motor taking power equally from each phase of the high frequency circuit may drive an alternator either single-phase or polyphase for furnishing current to the single-phase railway. The converting outfit may be located in the main power house or in a sub-station as may be found most convenient.

#### THE FIELD FOR SINGLE-PHASE RAILWAYS.

The development of a new and more efficient method for accomplishing a given result often leads on and opens new fields which had not been commercially practicable before. Such is the case with the single-phase railway. The direct current inter-urban railway has its limitations. If a region be sparsely settled the available traffic will not show a profit on the cost of circuits and rotary converter sub-stations. There is a material reduction in the investment and operating expense incident to the single-phase railway that will enable it to be built and operated with a profit in cases where the traffic would not support a rotary convertor system.

On the other hand, in heavy service the direct current has not made much headway, being handicapped by the heavy cost of sub-stations and of conductors. Heavy and relatively infre-

quent trains are the hardest loads for sub-stations. For example, if sub-stations be eight miles apart each will supply eight miles of track. A train running forty miles an hour will receive current from a given sub-station for 12 minutes. In order that a sub-station may be continuously supplying current to trains in one direction they must have a headway of 12 minutes. If they be an hour apart the current from each sub-station is used but one-fifth of the time. Trains in two directions will double the substation output, but as the peak load is considerable when two trains pass near a sub-station the load factor is extremely low. Therefore as the aggregate capacity of the sub-stations must be large in proportion to the actual power taken by the cars, it follows that the sub-stations will involve a relatively large expense if they are equipped with expensive rotary converters and require constant attendance, whereas the cost will be relatively small if they require simply lowering transformers having an efficiency very much higher than the rotary converter sub-station and not requiring attendance. The reduction in the sub-station is therefore of especial value when the service is infrequent. Moreover the single-phase equipment by reducing the size of conductors frequently enables the sub-stations to be more widely separated. This possibility in the reduction in the number of sub-stations and in the aggregate capacity of sub-station equipment, as well as the elimination of rotary converters with their energy losses and their attendants makes practicable the operation of long distance roads which could be operated by direct current only at an excessive cost.

The single-phase system therefore decreases the cost of installation and operation for the kind of interurban service which has been successfully developed by the direct current, and it extends the field of commercial work to include, on the one hand, rural roads with relatively light traffic, and on the other, a heavy, infrequent, multiple unit or locomotive service for passengers or for freight approximating steam railway conditions.

#### SINGLE-PHASE RAILWAYS IN OPERATION.

The single-phase railway which shows the most extensive operation as measured in car miles is the Indianapolis and Cincinnati Traction Company. Operation was begun over a short length of track, January 1st and on April 1st 37 miles were covered. Since July 1st a regular schedule has been maintained over 41 miles, 37 miles of which is under alternating current trolley and the remaining 4 miles is under direct current trolley

in the City of Indianapolis. The Company has 10 cars each equipped with four 75 h. p. motors. A maximum speed of 60 to 65 miles per hour is secured and the cars are not only the heaviest but they operate upon the fastest schedule of any of the numerous suburban roads radiating from Indianapolis. Some defects have been developed in the equipment, which, however, have been incidental in character, and not in those new features where trouble might reasonably have been anticipated. It was found that the natural ventilation under the car was insufficient for the transformer and a ventilating motor was added. A weak point developed in the armature insulation when the cars, which had been running for some time by alternating current, were first run regularly over the direct current lines into Indianapolis. One feature of the new condition was the opening of the circuit with four motors in series, the motors having laminated fields which give greater field discharge than solid poles. The remedy was obviously the strengthening of the insulation. This brings out the interesting fact that operation on alternating current at 3,300 volts with an intervening transformer is less severe upon the motor than operation on direct current at 500 volts. Experience showed wherein the control apparatus, suitable for both alternating and direct current, could be simplified and the apparatus reduced in quantity. The result is a control system which is relatively simple and compact, although suitable for operation interchangeably between alternating and direct current.

The best verdict upon the working of the single-phase system on this road at Indianapolis has been given by the operating company. It has been found in the contracts which have been placed for extending the present line a distance of 16 miles; also in extending the single-phase operation to the Shelbyville line, both to the 29 miles which have been operated by direct current and for a 20-mile extension. The length of track is therefore to be increased from about 40 to 100 miles; the number of cars will be double the present number and all equipments will be similar. It is significant that a company which has been operating two substantially similar suburban lines, one by single-phase current and the other by direct current, should see fit to throw out the direct current and substitute single-phase alternating current. It may be noted that this course was taken, although the reverse was easily possible, as provision was made in the original contract for the single-phase apparatus by which it would be exchanged

for direct current equipments if its operation proved unsatisfactory.

Other single-phase roads which are operating Westinghouse equipments show a variety of conditions, some having exceptionally sharp curves and steep grades. On the road between Derry and Latrobe, in Pennsylvania, 30-ton cars are started on a ten percent. grade. The cars have platform controllers and are equipped with four 50 h. p. motors. In some cases the initial operation has been handicapped on account of incompleteness, or through the use of temporary apparatus either in the power house or on the car. In its fundamental elements, however, the operation is proving perfectly satisfactory.

#### SOME NEW ROADS.

The extension to long distances will soon be shown in the carrying out of the contract which has been closed by the Spokane & Inland Railway Company for 150 miles of railway running south from Spokane, Washington. The equipment will consist of 15 motor passenger cars each with four 100 hp motors, 6 motor freight cars, each with four 150 h. p. motors and six 40-ton freight locomotives which may be in pairs for heavy trains. The engineer of this road has been intimately connected with the installation and operation of the single-phase road at Indianapolis.

The most notable recent event in electric traction is the purchase of Westinghouse single-phase locomotives by the New York, New Haven & Hartford Railway Company. The passenger trains on this road which enter Grand Central Station in New York run over the tracks of the New York Central Railroad for about 12 miles. As steam locomotives cannot enter the new terminal station and as the New York Central is equipping its track for direct current it is imperative that the New Haven trains be handled over 12 miles by direct current power. Instead of changing from electric to steam locomotives for all local and through trains at the end of 12 miles it was decided to extend the electrification and to do it, not by extending the direct current, but by changing to alternating current. The single-phase locomotives will be designed so that they may operate interchangeably from direct current or from single-phase alternating current.

The adoption of the single-phase system by one of the leading railroads of the country for its heavy and important passenger service is all the more noticeable; first, because its officials are already familiar with electric traction matters through the opera-

tion of many important city and interurban railways in New England, and second, because the obvious thing to have done would have been to follow the example of the New York Central by adopting direct current locomotives. Probably this is the turning point, and the coming electrification of heavy railways will follow the conspicuous example set by the New York, New Haven & Hartford Railway Company in adopting the single-phase system.

At the conclusion of the reading of his paper, Mr. Scott said: The development of this system has not been undertaken merely for the purpose of supplying the street railway manager with a new device, but it has been a development to meet the needs of railway service. The direct current has reached its limitations. Its cost of installation is very high in certain cases, and it is because there is a growing demand for this class of new apparatus that its development has been taken up, and I am sure that I voice the views of the engineers with whom I am associated when I say, as engineers, that we feel that this single-phase system should stand on its own feet.

If you find that the direct current meets your requirements as well or better, you have no particular reason for adopting the single-phase system simply because it is novel. We believe, however, that on its own merits it will be found of very great value in the development of the railway work which you men have carried on at such a rapid rate. In other words, the engineers of the manufacturing company are not foisting a fad upon you, but have worked out a system to meet your own needs. The single-phase system and its apparatus must be developed in the course of a few months or a few years, not only to equal, but to more than equal the result of the development of the direct-current system during the past dozen years. A great deal of the development can be done by the designing engineers in the factory, but as we well know, the service test is the final test, and a great many of the practical points as to control, the interworking of various parts and the best forms of apparatus must come from experi-

ence. That has been begun, but just as with the direct current after its fifteen years, so the alternating current after as many months has not reached perfection, but we have reached that point where we feel that, with our knowledge of the apparatus and with the experience which has been secured, it can now be presented to the operating street railway man as a perfectly feasible and practical system.

#### DISCUSSION OF MR. SCOTT'S PAPER.

President Ely: Are there any questions that any one desires to ask concerning this paper? Let me say that the companies, the representatives of which have read the papers here, have been so kind as to have with us the gentlemen who have written the papers and who are familiar with the subject, so that anyone who wants information ought to be able to get it.

Prof. W. E. Goldsborough: The subject discussed in the paper which Mr. Scott has presented for our consideration today is one to which every electrical engineer in the country is devoting a good deal of his time. The announcement which has been made before this association of the placing of an order for twenty-five alternating-current locomotives with the Westinghouse Company by one of our large steam railroad systems, is a very notable one. To my mind alternating current motive power is destined to play a most important part in railroading. Presumably, there will be no large electrification of steam railroads in the sense of miles of track extending across the country in which the system will not be used in some form. I think that the electrical fraternity, and particularly the operating companies, owe a great deal to the courage of the manufacturers of electrical machinery. I do not know that we can look back to any other period in the development of the art at which the manufacturers have taken so great a load off the shoulders of the consumers. This morning we listened to the papers on the gas-engine, and

reference was made to the steam turbine, and this afternoon we are discussing railway motors. I doubt if any company purchasing any of this apparatus in the United States really takes any risk.

As regards the specific characteristic of the apparatus under discussion, I have for a long time felt that the alternating-current system was coming to the front, and that ultimately the single-phase system would take a place over all other systems. I believe I once had the pleasure of defending the single-phase motor at a discussion in Chicago of the single-phase system used for lighting in St. Louis, at a time when there were only two of us in the room who would say a good word for the single-phase motor. I do not believe any designer of electrical machinery today is satisfied in his own heart with the single-phase alternating-current motor which he has had to use. I say this in spite of the fact that I do not know of all the good things which the designers of this apparatus have in store for us. The fact that we must use a 220-volt motor with a larger commutator than that in the direct-current machines is an indication in itself that we have better things to hope for, and I am confident in my own mind that in time, through insistent and persistent work on this problem, we will get a single-phase motor which will be more nearly analogous to the multi-phase motor and which will not have a commutator. A great many gentlemen in this room will say that I am wrong, and that the problem has been given up, but I still feel that there is a demand for it. Necessity, the Mother of Invention, will produce the article we are looking for.

When it comes to the question of maintenance of equipment, I feel that we should step aside and look the ground over carefully before we throw out direct-current equipment for alternating-current equipment. When you have a very large number of equipments operated on a rather restricted mileage, then you are confronted with a condition wherein

maintenance is an important factor, and there is no question but that at this time it is much cheaper to maintain a direct-current system (I mean maintain the motive power equipment) than to maintain an alternating-current system. On the other hand, if you are confronted with a great deal of mileage, and a relatively small number of units operating over this mileage, then maintenance of motive power equipment is a matter of secondary consideration, and you can use alternating-current motors and can take long chances in the matter of maintenance for the reason that you will be saving so much on the investment in copper and sub-stations and other things.

I believe each of these problems is going to be met by the engineer and solved by the engineer, not for the sake of having a new thing—and we must grant the American engineer and the American people generally are enthusiastic for new things—but for the practical utility of these things. As thoughtful men we should discard any consideration of these things because they are new, but look upon each problem from an engineering standpoint, and use the direct-current apparatus in those places for which it is best adapted. However, without the alternating-current apparatus, it goes without saying that the enormous expansion which is to take place in electric railroading in this country would be utterly and entirely impossible.

Mr. C. O. Mailloux: I am greatly interested in the subject of single-phase alternating-current traction. I went to Europe last year on purpose to study it, because it was only there that anything was then being done with it commercially. I visited all the single-phase railway installations in Europe, and came back pleased with the result of my visit. I am pleased that we are beginning to make progress with it in this country. I have no fear but that we shall soon entirely outdistance even the good results obtained in Europe. I believe that there is a great future for it, but I want to emphasize

the words which Dr. Goldsborough has said about studying each case by itself. The principal lesson conveyed to me by some of the papers, and especially by this one of Mr. Scott's, is that we should not go too hastily; and it teaches also the importance of good engineering, not only from the standpoint of the manufacturer, but more particularly from the standpoint of the operating companies. The operating company, as a rule, has its engineering done for it by the manufacturers, and to this is largely due the great number of mistakes which have cost a great deal of money. We cannot, and should not, blame the engineers of the manufacturing companies if, in doing their duty to their employers, they sometimes consider the interests of the manufacturer too closely and those of the purchaser too remotely or indifferently. The practical application of the statement which I have made is this: that the present paper on single-phase alternating-current traction will, if nothing more, act as a wholesome check on the rather reckless or unwarranted introduction of the so-called alternating-current sub-station system of distribution which has been used for interurban work in many cases. There are many cases in the middle West of companies which are blessed, or perhaps cursed, with applications of that system where it has been indeed a very expensive luxury. The statement which Mr. Scott makes of those cases where the rotary sub-station is idle 75 percent of the time is a clue to the kind of engineering which has been responsible for that sort of work. It shows exactly what Dr. Goldsborough just stated, namely, that in matters of that kind we are too apt to follow fashions and adopt them too readily, and that we jump too quickly at the conclusion that because a thing is good for a certain case, it is going to be good for another case. While I have much faith in the single-phase system, I do not believe that the d. c. motor or the d. c. system is to be put on the shelf forthwith. I was recently called in consultation with two other engineers by the power committee of a

board of directors in regard to the new equipment of a road. I found that those who had undertaken to do the engineering for that company had received their inspiration more from the manufacturer's interest than from the study of the interests of the operating company, and had recommended an alternating-current system of generation and distribution with d. c. sub-stations. I looked over the case carefully, and I said: "Don't, don't make that mistake; stick to direct current." I found that a director of the railroad company, who was himself operating an electric lighting plant in the same city, was in favor of the alternating-current system, having been converted by the manufacturer's engineers, though he himself was operating an Edison three-wire d. c. system. He had never understood the real inwardness of the situation until I explained to him and his colleagues that, in their particular case, the electrical "center of gravity" of the system was within two miles of the station. That is, if you take the total car miles for the heaviest day (and the heavier the day the more strongly the fact was shown) their center of electrical distribution was at an average distance of something like  $1\frac{3}{4}$  miles from the power station, and over 75 percent of the car miles was run within the city limits and within a radius of six or seven miles. Gentlemen, I characterize the attempt to foist on that board of directors a system of alternating-current sub-stations as foolish, to put it mildly, and I believe that such a thing will react on the manufacturers. That was a striking case, a splendid example where it will pay the company to have their engineering done for them on their own account and at their own cost. These directors, I am pleased to add, quickly saw the point, and they decided to follow the recommendations of the engineers advising them. The paper read shows the possibilities of a system inherently far better adapted to many cases that we know of in the West, than the previous systems. This paper is opportune, because those who are assembled here might otherwise be tempted to make

equally as ridiculous mistakes as those already made. They will be deterred from making such errors, and will either wait until the single-phase alternating-current system has been perfected sufficiently to warrant their full confidence, or, if in doubt, will accept it in preference to the other, in cases where the other has not proved an undiluted success. I do not know whether I voice Mr. Scott's sentiments in stating that in many cases of long-distance traction today the single-phase system, even in its present state, will be more practicable than the other system. It may be alleged as an excuse for the other that it was introduced at a time when it would have been impossible to have gone a very long distance without it. That is, perhaps, true; I do not wish to make any categorical criticism of them all, for there are many cases in the Middle West where the system is eminently practicable, and where it is today the very best,—cases where the traffic is very frequent and where you have sufficient mean power distribution over the whole line to warrant the use of such stations. My criticisms refer particularly to the cases where they find the cost of operating sub-stations to be so great that they are trying to find employment for the men who run the sub-stations, by making them wind armatures or field coils, so as to justify charging the larger part of their time to the mechanical and repair department. Some of these cases are sad and would have been prevented by a little discretion or discrimination in the selection of the system. I am glad that this paper has been presented before this body. It shows we have made a great deal of progress; and that there are today two good single-phase systems both of them sufficiently good for the great majority of these cases just noted, is interesting. The single-phase a. c. motor will greatly enlarge the field of operation of the companies operating the d. c. motor system, by enabling them to extend their lines in the suburbs. In the particular case to which I have just alluded, I told the gentlemen that even granting the possibility that they may, some

time or other, want to go as far as twenty-five miles, it would still be better for them to generate their power current with d. c. and transform what little portion of it might be wanted into alternating current for their suburban lines, which, in car-miles, represents only a relatively small percentage of the whole system. I made the very suggestion which is practically that made by Mr. Scott, namely, that they should run the lines in the city with the direct current as they have been doing; that they could, if necessary, buy a few new single-phase equipments for the suburban lines; then run with direct current inside of the city limits, and even for some distance beyond use the alternating current (single-phase) to operate the longer suburban lines. There will, doubtless, be a very large field for that sort of work, and we are apparently on the point or realizing it practically.

Mr. Scott: There is one gentleman here whom I am sure we shall be glad to hear from, and I know he can give us some information about the system. He is the man who has been running the single-phase road at Indianapolis. Mr. Nicoll, the chief engineer. He is the man Mr. Mailloux talked about among the operating men who had the courage to go ahead. In talking over this paper with my colleagues, they were very anxious that in presenting it to this Association—the matter of the single-phase railways—there should be nothing done in the way of covering up the details of operation; that there should be no air of mystery about the single-phase motor. They have done their work and given you the results. We believe that if the practical men of this Association, understood frankly as operating men what was the nature of the trouble encountered, they would understand the circumstances and be as well satisfied as we are as to the fundamental elements. This being the case, you need not hesitate to ask Mr. Nicoll what questions you choose, and he need not hesitate, so far as the manufacturers are concerned, to reply freely.

Mr. G. D. Nicoll: I do not know that I have anything

special to say regarding the operation of our system. As Mr. Scott has outlined very clearly some of the minor details, I think you will understand what troubles we have had. As stated in the paper, we began operating on the first day of January of this year. On the 1st of April we ran within four miles of Indianapolis, all of the operation being on the alternating current. We were handicapped in getting into the city of Indianapolis on account of two overhead bridges which were so low that our cars could not pass under them. These were raised, and on the 1st of July we began operating into Indianapolis. The line was then 41 miles in length, 37 of which was on the alternating current, and the remaining four miles on direct current in the City of Indianapolis. Up to the time we began operating into the city we had no trouble with the motor insulation. The worst trouble was the question of the transformer ventilation. This was overcome, but on operating the motors in the City of Indianapolis defects developed in the motor windings. These were also overcome, and we are having no further trouble. We are operating the highest schedule that is maintained in the State of Indiana, collecting our current by means of a bow trolley. We have experienced no trouble whatever with the bow trolley. I am not able to give any data as to the car mileage or the life of the shoe of the trolley, which is composed of wood plated with aluminum, but it will suffice to say that the cost of operation and of renewing the shoe is not more than, and I consider it less, than would be the case with the ordinary trolley. In general terms I can say that we are well pleased with the operation of the equipment. Some minor changes have been made in the apparatus, but on the whole it has been very satisfactory.

President Ely: We would like to hear from Mr. Potter in this discussion

Mr. W. B. Potter: As I make some reference to this

subject in my paper, perhaps it will be just as well to proceed with the paper, and take that subject up as I come to it.

Mr. Potter read his paper as follows:

#### ELECTRIC RAILWAY EQUIPMENT.

The American Street Railway Association—

Gentlemen:—The Annual Meetings of the American Street Railway Association not only are occasions for the exchange of ideas between the operating Companies, but they also afford an excellent opportunity for engineers concerned in the selection or development of the various appliances to study the present and future requirements in their broader aspect.

Recent years have witnessed such radical changes in many of the details of electric railway equipment, that it is advantageous to occasionally review the modifications made to meet the requirements of modern railway practice. Numerous changes are made each year, and while the general trend is toward improvement, the ultimate degree of perfection is only attained through the experience resulting from a thorough trial of the new ideas under operating conditions. In this respect the designing engineer and manufacturer owe much to the operating company, an obligation which should be, and I believe is, fully recognized.

The limits of this paper will permit only a reference to a few of the features relating to the development of the past few years.

No more prominent example can be found to demonstrate the rapid march of progress, than the introduction and successful operation of the steam turbine, of which there are several types now on the market. The extent to which the reciprocating engine is being superseded is indicated by the sales during the past three and a half years of one type of turbine alone, which amount to over half a million kw. of which about one-third are for electric railway service. These figures are mentioned for the purpose of emphasizing the recognized importance of the steam turbine as a prime mover.

As compared to the reciprocating engine there are several important advantages known, but perhaps not generally appreciated at their true value. The steam economy of a turbine at full load is at least equal to and frequently higher than that of an engine of similar capacity and at fractional loads the degree of economy is decidedly in favor of the turbine. This is owing to

the relatively more efficient utilization of the steam at partial load and also the lower frictional losses. As the load factor of a prime mover is usually less than full load, the resultant relative economy of the turbine is considerably higher than if it were compared with the steam consumption of both the turbine and engine at full load—a comparison at half load would be more representative of the average operating performance of a railway power station. The turbine has also the advantage of a better maintained operating economy as it is not dependent upon the setting and fit of admission and exhaust valves, the derangement and leakage of which may reduce the initial economy of the engine 15 percent, or even more depending upon the degree of attention which the engine receives.

The fact that both the attendance and maintenance of a turbine are less costly than for a reciprocating engine of corresponding capacity can be readily understood by a comparison of their mechanism. The simplicity of the turbine affects, not only these factors, but also the reliability; this has been proved by extended runs and further by accidental admission of water which, although harmless to the turbine, would have caused serious injury to the engine.

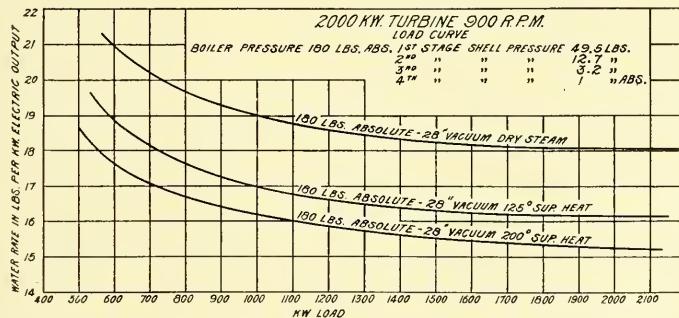


Fig. 1.

The curves shown in Fig. 1 illustrate the performance of a 2,000 kw. Curtis turbine at different loads and under various steam conditions and also show the characteristically high economy at the fractional loads.

The higher economy secured by superheating does not altogether represent an equivalent reduction in fuel, as a certain additional amount of coal is required to produce the super-

heating. The net result, however, shows a saving in favor of superheating.

While the larger sizes of steam turbines have been more generally used for driving alternators, they are adapted for direct current railway generators, and turbine sets of this character have been built up to 2,000 kw.

The turbine certainly gives great promise of being the only steam driven prime mover of the future for producing electric power and its usefulness is by no means limited to that particular field.

Each year bears evidence of the growing popularity of electric traction and the increase in traffic has naturally affected both the size and weight of the cars and the schedule speeds. The more onerous conditions imposed on the electric apparatus to meet the ever increasing demand for greater seating capacity on systems already operating at 500 to 550 volts, has led to an increase in the generated voltage. We have been accustomed to consider 500 to 550 as the standard direct current voltage but 600 volts are now being used to such an extent that it has really become the standard for the power station.

The direct current railway motor has been greatly improved and has undergone more changes in detail than is perhaps generally appreciated. The old troubles of sparking and flashing at the commutator have been practically eliminated. Previously it was considered advantageous to short-circuit a turn on the field winding to reduce the sparking at the brushes and in the controller, the idea being to restrain the rapidity with which the magnetism of the motor changed, but several years ago it was found that while this provision decreased whatever troubles occurred due to opening the circuit, that it was a positive cause of flashing in cases where the current was interrupted and suddenly applied. For example this trouble would occur on passing a section insulator with the controller on, and more especially when operating with-sleet on the trolley wire or running over a third rail with an uneven surface.

The field coils as now made not only have no short-circuiting turns, but where metal spools are used, it is customary to split the spool and introduce an insulation into the shell to eliminate every feature of a short-circuited turn.

The armature speed of a motor affects the performance of the armature bearings and also the sparking and wear of the commutator and, while it would be possible to build a lighter and

cheaper motor at higher armature speeds, a maximum of 1,500 r.p.m. appears from experience to be the highest desirable limit.

To meet the requirements of the higher voltage now more generally used and to insure stability of the motor as regards flashing, there is a tendency toward increasing the number of commutator segments and armature conductors per pole; thus reducing the voltage between adjacent commutator segments and giving an armature having its maximum r.p.m. within the limits of good practice.

The commutator being a revolving switch, it is important if sparking and flashing are to be avoided that the brushes should maintain good electrical contact with the copper segments. As commutators are built up of alternate sections of copper and mica it, therefore, sometimes happens that the mica does not wear evenly with the copper; in such cases the sparking becomes more pronounced and there may even be serious trouble from flashing; the most effectual remedy for this is to groove out the mica between the commutator segments to a depth of about 1-32 of an inch below the surface of the copper. Many cases of troublesome commutation may be wholly cured by this expedient.

The performance of a motor for any service may be limited by its commutation or, as is more commonly the case, by its heating. The heating of a motor is affected by the losses in both the copper and iron, but the relative heating effect of these two elements is quite different. The copper losses predominate during acceleration and the iron losses when running at the higher speeds; the effect of the iron losses is, therefore, to limit the capacity of the motor for continuous running. Although the service in which motors are now commonly used does not call for a continuous run of many hours at full speed, without occasional accelerations, the iron losses are of importance, and more care is now exercised in the selection of the iron for the armature than formerly. The principal cause of these iron losses are the eddy currents in the iron and to eliminate these a special study has been made of annealing and japanning the laminations.

While the temperature of a motor under given conditions is proportional to its internal losses the actual temperature rise may be greatly influenced by ventilation, a proper system to assist in dissipating the accumulated heat. Forced ventilation by means of a blower, similar to that used with air blast transformers, may be employed; and by this means the temperature of the motors in any particular service may be very much reduced, but

the complication is such that it does not seem well adapted to the ordinary electric car. Forced ventilation is, however, well suited to locomotive work where the blower may be carried in the cab. As the motor commonly used depends upon its own rotation for ventilation, the arrangement of the ventilating passages must be carefully studied, to secure not only the best cooling effect, but to prevent brake shoe dust and carbon dust or other injurious material being deposited upon the insulating surfaces of the motor which cannot be conveniently cleaned.

For this reason it is inadvisable to provide ventilating ducts just at the back of the commutator ears as any accumulation of conducting dust at this point is sure to produce burn-outs. It has also been found advisable wherever ventilating ducts are provided through the core head to extend the slot insulation of the armature coils for some distance beyond the end of the core.

The use of oil in preference to grease for the lubrication of motor bearings seems now to be universally favored. Of the various methods of lubrication which have been tried, a waste packed journal with an oil well, similar to the journal box of a car truck, has given the most satisfactory results. Nearly all the larger motors at the present time are designed for this method of lubrication.

The mechanical injury to motor armatures usually results either from the armature striking the pole pieces or the mechanical weakness of the armature binding. The former, where resulting from the wear of the armature bearing linings or loose cap bolts, can be avoided by a proper system of inspection, but the latter is a question of motor design.

The strains to which the armature bindings are subjected, particularly if the car is speeded above the normal, by driving it with power down grade, are not ordinarily appreciated. As an illustration, the weight of the armature coils in a 125 h. p. motor is less than 200 lbs. and yet the radial centrifugal strain of all the coils at 1,500 r.p.m. is about 48 tons, giving a resultant strain of over 15 tons to the binding wires, and even if these wires are strong enough to hold the coils without breaking, they may stretch enough to permit a considerable movement of the coils in the armature slot, resulting in an abrasion of the insulation. An armature should be so bound that there will be no evidences of weakness at 50 percent. above the maximum normal speed, and the ultimate strength of the binding or bursting speed



New York Central Electric Locomotive, with Dynamometer Car and Test Train.

of the armature should be designed for at least double the maximum speed to insure the proper margin of safety.

The field coils of a motor, although subject to less potential than the armature, by reason of their location in the motor, are more liable to injury from occasional water. A distinct improvement has been made in the construction of field coils by immersing them in a bath of hot compound under vacuum. The effect of this process is to thoroughly fill all air spaces with compound which not only renders the coil more water-proof but also makes it more solid and less liable to injury from mechanical vibration.

More attention is being paid to the fit of commutator and oil well covers which, being frequently opened, are now provided with machined seats to insure a better fit for the exclusion of dirt and water.

With the increased capacity of these motors the strains on the gearing have very much increased, particularly on the pinion teeth which are of weaker section than the gear teeth. To meet these severe conditions a very high grade of steel is required both with respect to ultimate strength and elastic limit. The grades of steel commonly used five or six years ago would by no means answer for the pinions of the larger motors built today. Not only are the strains severe, but owing to the over-hang of the pinion, the face of both the gear and pinion teeth when new and doing heavy work are not in contact across their full width. The strain is borne principally by the ends of the teeth nearest the motor, with the result that a shearing action takes place which will sometimes break out a part if not the whole of a pinion tooth. As a pinion wears the teeth become thinner on the side toward the motor so that a pinion which has been in service until its teeth match with the gear across the full face, may prove stronger under stress than a new pinion.

The solid axle gear is to be preferred to the split gear, and were it not for the inconvenience of removing the car wheel, would doubtless be more generally used. The objection to removing the car wheel for the reason that its fit on the axle is impaired, may be overcome by the use of a wheel with an extended hub, on which the gear is shrunk, as proposed by Messrs. Doyle and Brinkerhoff and in use on the Interborough, in New York City.

The more severe demands of present service have also necessitated changes in the older type of controllers, as well as the development of new types of control and control appliances.

The cylinder controllers have been improved by making the arc deflectors of a more vitreous material, less affected by the arc and productive of a much smaller quantity of conducting gas when opening the circuit under abnormal conditions.

For the control of equipments aggregating 200 H. P. and over, the Type-M control, consisting of electrically operated contactors or switches, is recommended and is being very generally used. It is not only possible to handle heavier currents and a higher voltage by contactor switches, but a further advantage lies in the fact that the master controller occupies considerably less space than a cylinder controller handling the full motor current.

Whether the cars are operated singly, or in trains as in the Sprague-General Electric multiple-unit system, the control may be either hand operated or automatic in its action; in the former case the handling of the master controller is similar to the ordinary cylinder control, and there are controller notches corresponding to each rheostatic step and the series and parallel running points. In the automatic control there are only three positions of the handle, the first one giving slow movement to the car for switching; the other two points being the series and parallel running positions. The intermediate rheostatic points are actuated automatically by a series relay on each car of the train. The automatic form of control is well adapted for services where the rate of acceleration may be predetermined and need not be dependent upon the judgment of the motorman.

For automatically protecting the equipments from the results of accidental short-circuits it was the early practice to provide fuses consisting of a composition of lead and tin; and although magnetic fuse boxes were used, their action with this type of fuse was not always satisfactory. It was partly for this reason and because of the time required to replace fuses, which with the older types of equipment were more frequently blown, that the automatic circuit-breaker came into quite general use. On the larger equipments, however, where the circuit breakers had to be set for 1,000 amperes or more, it was found difficult to provide space for them in a position where the arc resulting from a short-circuit would be free from danger of grounding to some other part of the car. As a substitute for the circuit breaker in this heavier class of work, many different forms of fuses have been tried, but none have proved thoroughly reliable with the exception of a fuse composed of thin copper ribbon enclosed in

an insulating chute and surrounded with enough iron to provide a magnetic field. This copper ribbon fuse has been quite generally used on the larger equipments for the past few years and has given excellent satisfaction. The same type of fuse is applicable to smaller equipments and in many cases it may be found superior to the circuit-breaker, as its reliability is a strong point in its favor. A circuit-breaker should have frequent inspection and in cases of several repeated short-circuits it may be so injured as not to finally extinguish the arc without an amount of flame that may alarm the passengers.

It is a matter of favorable comment that the car wiring is now receiving much more attention than formerly. Those familiar with the character of work formerly done, will readily testify to the advantages secured by eliminating the dangerous practice of attaching the wires by staples or other means to any convenient place on the under side of the car and often without regard to the movement of the brake levers and compression of the springs of the loaded car. The best recognized practice is now to install all wiring in an iron conduit and if properly done with the ends of the pipes fitted with bell mouths or other provision to avoid abrasion of the wire, the car wiring should prove the most safe and permanent part of the electrical installation.

The suggested improvements in wiring apply with even greater force to the lighting and heating circuits, as these circuits have generally been given less attention than the motor circuits. As a source of fire, the lighting and heating wires are dangerous on account of their location in the roof or sides of the car, their inaccessibility for inspection and the fact that current is often left on these circuits when the cars are in the barn.

While many of the preceding remarks have been based more particularly on the experience with direct current apparatus, the essential principles apply equally to the alternating railway equipment.

The role of the manufacturer is to design and construct such apparatus as will best meet the conditions of the operating companies and it is, therefore, the requirements of the operator that should be studied rather than the development of any particular idea.

During the past year there have been several installations of alternating railway equipments and the outlook is very promising for this class of equipment under conditions advantageous to its use. Considered wholly from a technical standpoint there

is no question but that alternating current motors can perform any service now done by direct current apparatus, but the choice, as between alternating and direct current should not be made without a full consideration of the direct and indirect expense incident to either type of equipment.

As the street railways and the steam railroads are now becoming so closely identified, a reference to some of the recent tests of the New York Central Electric Locomotive will not be out of place. This locomotive has now run over 21,000 miles with

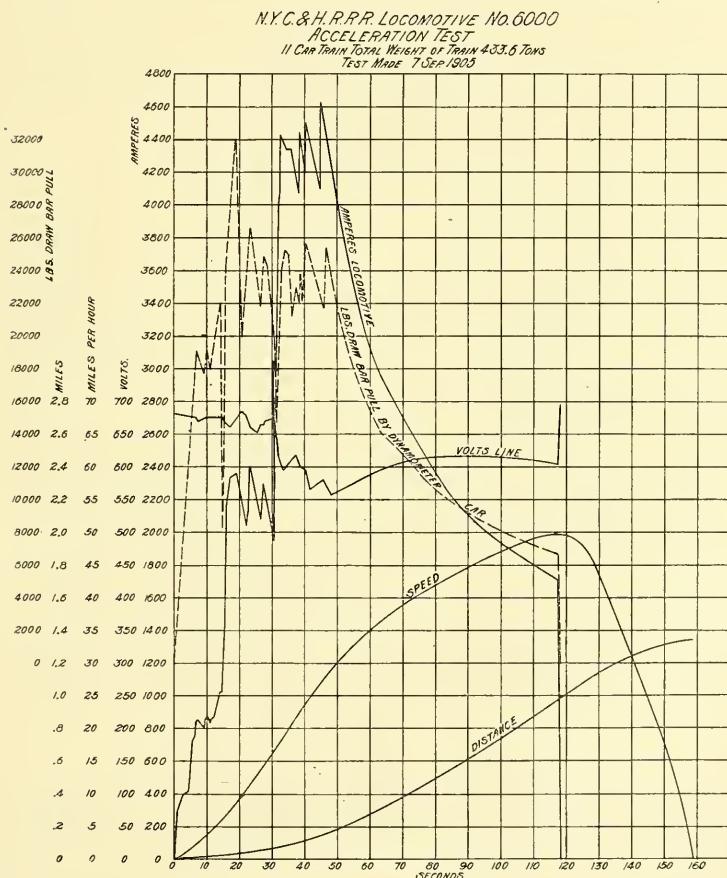


Fig. 2.

trains of varying weights. The maximum speed attained with a train weighing 278 tons, including the locomotive, was 71 miles per hour in a distance of about 4 miles. With the locomotive alone the maximum speed was 85 miles per hour, with the probability that the speed would have been 100 miles per hour had the run been twice the length.

The accompanying curves show tests made with an eleven-car train, including the New York Central dynamometer car, which were made for the purpose of checking the results obtained from the speed-torque characteristics of the motor.

Fig. 2 shows an acceleration test, all the records of which were taken with automatic recording instruments. The draw-bar curve was taken by the dynamometer car, with no damping device or dash pot to control the fluctuations on the recording

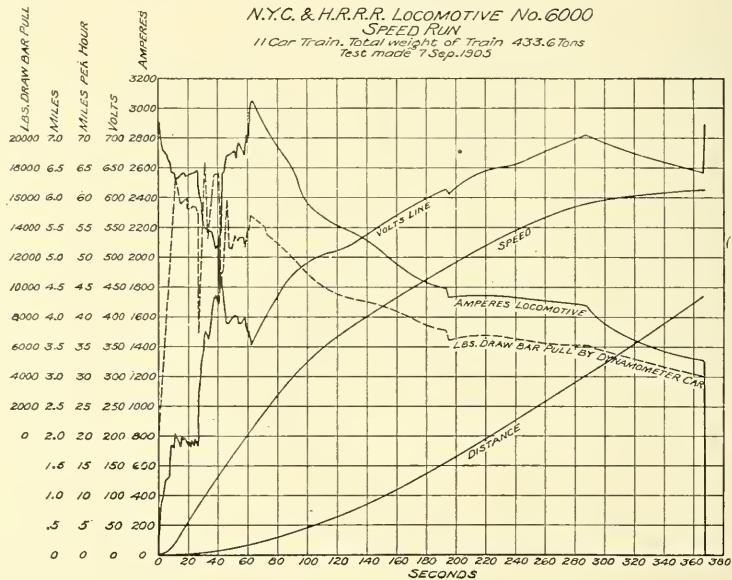


Fig. 3.

pointer. The comparative steadiness of the pull of the electric locomotive will appeal to those who have seen a dynamometer record, without the damping device, taken from a steam locomotive.

Fig. 3 shows the curves of a speed run over the test track

with the same train. The notch in the curve at about 190 seconds is caused at that point by the locomotive leaving an additional strip of third rail which was fed from some distance away.

The total weight of this locomotive is 97 tons, of which about 70 tons are on the drivers. The nominal rated power is 2,200 h. p., although the output during acceleration has often exceeded 3,000 h. p.

On page 295 is shown a print of the locomotive with this eleven car train attached, the weight of the train, including the locomotive, being 433 tons.

In conclusion, I would call attention to the benefits that may be derived, both from an operating and manufacturing standpoint, from a record system covering the mileage of parts and detail cost of maintenance of the car equipment. The records of the power and sub-stations which are more easily kept, seem to be fairly complete, but of the car equipment the records do not seem to be generally available in such form as to permit a comparison of the relative merits of any particular method of operation or quality of material. If a uniform system could be standardized and the records submitted at each Association meeting, they would be a valuable source of information and a further incentive to improvements in the design of apparatus and the methods of operation.

Respectfully submitted,  
W. B. POTTER.

At the conclusion of his paper Mr. Potter said:

Without doubt there is a large field for the alternating single-phase railway motor, and where the service conditions are such that the desired results can be obtained with a smaller expenditure this type of apparatus can be used with advantage. Likewise there is a field of usefulness for the three-phase induction motor, but whatever type of equipment be installed it should be selected with special reference to the work it is required to perform.

The comparative expenditure for equipping a given project with single-phase alternating or direct current apparatus can be accurately determined, but this comparison of first cost does not represent the net result of operation. The comparative maintenance cost of both systems should also be taken

into account. The elimination of the rotary converter and the possibility of operating without sub-station attendants who have no other duties, is a credit in favor of the alternating current equipment. The maintenance of the car equipment itself will, however, in all probability be more expensive for the alternating current than for the direct current equipment. There are several inherent features in the single-phase alternating current motor which will influence the question of maintenance and to which I will briefly refer. The magnetism of the motor, like the current by which it is produced, is alternating in character and develops differences of potential in the windings of such a degree and character as to be more liable to prove injurious to the windings than in the case of the direct current motor. For instance, should a single turn of the field winding in a direct current motor become short-circuited on itself, the effect would be simply to eliminate one turn of the field coil; while in an alternating current motor, a similar short-circuit would cause that turn to act as a secondary of a transformer and a large local current would be produced within the short-circuited turn, which would soon burn out the coil.

The alternating magnetism also produces within the armature coils an electro-motive force which injuriously affects commutation and necessitates special provision being made to secure results comparable with direct current practice. A feature essential to the commutation of the alternating current motor is an additional field winding, known as the compensating winding, which is wound through the face of the pole pieces midway between the ordinary field coils and serves to neutralize the armature reaction. In addition to this compensating winding in the fields the motor armature is sometimes provided with what are called high resistance leads between the armature coils and the commutator. The effect of these leads is to diminish the local current in the armature caused by short-circuiting adjacent commutator segments by

the brush. The location of the compensating winding in the pole face renders it liable to injury in case the armature coil should strike the pole pieces and the presence of high resistance leads may, under some circumstances, result in severe local heating and burning out of the armature.

The magnetism of the motor, owing to its alternating character, is of less average density than in a direct current motor with the result that, for a motor of given dimensions and output,—the armature speed is considerably higher. To keep the armature speed within the limits that direct current experience has shown to be advisable as affecting the performance of the bearing and a proper contact of the brushes with the commutator, it is necessary to make the alternating current motor of larger size for the same output.

The characteristics of an alternating current motor, particularly the power factor, are affected by the air gap between the armature and pole pieces; better results being secured with a smaller gap. The alternating current motors as ordinarily designed have an air gap of about one-half that commonly used in direct current motors of the smaller sizes and even a less percentage of air gap in the larger motors.

We have, therefore, a tendency toward higher armature speeds and a smaller air gap, coupled with a field winding wound in the pole faces, conditions which necessitate more frequent and careful inspection of the motors or else more frequent and expensive injuries to repair.

It is probable that the maintenance of the control and other appliances will not differ materially from that of a direct current equipment. The maintenance of the car equipment is, however, not a controlling factor in the cost of operation, and if it should be doubled and even trebled, the alternating motor maintenance may be far more than offset by the reduction in fixed charges resulting from a lower first cost of the proposition considered as a whole. The conditions which demand more frequent inspection, particularly of the motors, may

presumably be a cause of more frequent interruption in service; hence the importance of giving the alternating equipment more attention than is customary with direct current motors must not be overlooked.

Improvements in detail will, undoubtedly, be made and the motors will be strengthened and improved in such features as may develop a weakness, but there appear to be certain inherent conditions, some of which I have mentioned, which cannot be wholly eliminated in the alternating current motor as we know it today.

I would also call attention to possible interference with telephone and telegraph lines which may result from the installation of an alternating current trolley adjacent and parallel to such circuits. The telephone lines having a metallic circuit are more subject to electro-static influences, the effect of which it is possible in some degree to eliminate. The telegraph lines having, however, a ground return may have developed within the circuits sufficient electro-motive force to seriously affect the working of the instruments. A metallic return with the circuits frequently transposed, as is common in telephone practice, may prove an efficient remedy.

The alternating control of the single-phase motor differs from that of direct current in having a transformer or compensator carried on the car as a medium for supplying the motors, instead of using the fixed voltage of the trolley line. The secondary windings are provided with taps giving different voltages and each point of the controller is, therefore, an efficient running position and furthermore additional taps may be provided in the secondary to give higher voltage than the normal running potential; this higher potential serving to give a higher speed to the car for making up time or to compensate for any abnormal drop in the trolley voltage.

#### DISCUSSION OF MR. POTTER'S PAPER.

Mr. John I. Beggs: I desire to ask a question on the subject of Mr. Potter, to see whether the answer will be as

pronounced as was Mr. Scott's, when he expressed his views concerning the single-phase motor as to its present state of development and as to the advisability of adopting it on operating roads. Mr. Scott's paper has been of great interest to me. I feel differently toward the single-phase motor from what I did when I came to this convention, and I wish to say that if I had obtained no other benefit from this convention than that which I have gathered in the last hour, I should feel myself fully repaid. In connection with my associates I have given a great deal of attention to the development of this motor. The representatives of the manufacturing side of the two large manufacturing concerns have not previously been nearly so positive in making statements from the commercial side as Mr. Scott is in his statements from the engineering side; and I have been wondering what the reason for the reticence of the representatives of the commercial side was, whether there was a disinclination to go into this matter extensively, or whether it was doubt as to the results of the promises of their engineering corps. In one of the large street railway properties which I administer, we have interurban lines radiating like the spoke of a wheel. We bring our large interurban cars and trains into the center of the city. We must enter the city over six or seven miles of track, operated by direct current. I have sent representatives during the past twelve months to investigate these various lines operated with alternating current, and we have had very conflicting reports concerning them. One of the most recent reports was to the effect that the system was so unsatisfactory that it was to be abandoned. We were contemplating trying the apparatus, but it has been very difficult until today to obtain data that the manufacturers were willing to stand by. At the present time I am building three 12-mile extensions, the farthest point of which will be about 35 miles from the center of operation. It is intended to continue these extensions to 50 or 75 miles, possibly 100 miles, in our development of that section of the country. It is a serious

question whether we should put on this composite motor; and if it would be equally effective with the direct current as it would be with the alternating current in the more sparsely settled sections of the State, on many of the lines a car operating only once every one or two hours. This is one of the most meaty papers I have ever heard presented at a meeting of this Association, and I desire to know whether Mr. Potter and his associates in the engineering department of the General Electric Company feel as confident on this question as Mr. Scott appears to feel in his paper and by his remarks following its presentation. One of our representatives came back from one of the tours of investigation with the statement that after you got onto direct current the capacity of the motor was greatly reduced; that taking a 75-h.p. motor, which seems to be about the maximum size that it is practicable to get under the ordinary car which is used for both urban and interurban service, the capacity of the motor was cut down very greatly when brought onto the direct-current system. I now understand that is not the case, and that it has practically the same power d. c. that it has on the alternating-current section of road. As we have present the representatives of two of the large electrical manufacturing companies, I want to get some information from both. There seems to be some difference of opinion between the engineering, manufacturing and the commercial sides.

Mr. W. B. Potter: I would say in reply to Mr. Beggs' question that there is no doubt that the alternating current motors can perform any service now done by direct current apparatus. I believe that fully. There is no question in my mind on that point. The proposition is simply a question of judgment and selection as to whether you should or should not use the alternating current.

Mr. Beggs: That is what perplexes the man who must take the responsibility of expending hundreds of thousands of dollars. It is a question which we have up now, whether we

shall build at points, say 35 miles distant from our main center of generating power, new power stations, or depend upon the alternating current single-phase motor. It is the doubt you throw out which perplexes those of us who are charged with determining what the engineering shall be. When there is a difference of opinion between the most eminent authorities in the business, it leaves the layman in a quandary.

Mr. W. B. Potter: In replying to Mr. Beggs I would add that the question of judgment and selection as to whether alternating current motors should or should not be used refers mainly to the financial question and not strictly to the engineering proposition. Both these factors are, however, closely related and while it is the latter which determines the former, it is the former, giving due consideration to all incident advantages, which should govern.

The alternating current motor when running on direct current will do even more work than it will on alternating current:—a good alternating current motor in a general sense is a most excellent direct current motor, with respect to acceleration and heating.

Mr. Beggs: I gather from Mr. Scott's paper that it would cost less money to put in the composite system than to limit one's self to the direct current, and install sub-stations and power plants at different points.

Mr. W. B. Potter: It depends largely upon the relative cost of the car equipments, sub-stations, and trolley conductors, for any particular proposition. On a road of say 50 miles in length employing few cars, the saving secured by the use of a high potential trolley would be so much greater than the additional cost of the alternating car equipments that there would be little question but that alternating current apparatus would be more suitable for such a proposition. On a road of a few miles in length and having a number of cars per mile the relative cost of alternating car equipment would be a much larger proportion of the total cost and whatever saving could be made

in the trolley conductor system would be relatively small. As I have stated before, it is not, however, wholly a question of initial cost, but it may be said in general that where the initial cost for alternating current and direct current installations is about equal, the choice should be for direct current equipment, owing to the probable lower maintenance of the installation as a whole.

Mr. C. O. Mailloux: I think both of the gentlemen are right, though they do not express themselves in exactly the same terms. Let us define these terms, and the whole situation becomes clearer. Mr. Potter is correct when he says it is a question of finance, or that it is a question of the financial analysis and estimation of many factors which bears upon and affects the operation of the road, but it is, unfortunately, one of those financial questions involving consideration, both technical and financial, which can only be properly handled by a competent engineer. That is what it means. If Mr. Potter had said it was a question of financial engineering, or of engineering finance, he would have made the statement a little more clear. To put it somewhat differently, we may say that the question whether the equipment shall be alternating single-phase or whether it shall be direct current fed by sub-station systems depends, in general terms, largely on the number of car-miles run per mile of track, or, to put it differently, on the headway. Suppose, for instance, we have a line 35 miles long and expect to run only three round-trips a day; there is no question but that the single-phase system, even in the crudest form, would be the only thing to use. Those who have undertaken to solve the problem in such a case by the use of sub-stations are sorry now, or soon will be, for it. Perhaps one remark by Mr. Potter gives a clue as to why some of them were led to do it. It was possibly because there were then no direct-current turbines on the market. They had good turbines for alternators. The temptation was placed in their way, and they were led into it. I wonder if, today, they would

not do what others will do, namely, generate current direct when the bulk is to be used as direct-current, and have a little of the current converted into single-phase or multi-phase for the outlying districts. Again, to go to the other extreme, suppose we have a line of considerable length in miles, but with heavy traffic, with trains running on 10 minutes headway, especially with double or four-track equipment; it is manifest that there is no question but that the three-phase a. c. transmission with d. c. sub-stations would be the better plan. Evidently, between the two extreme cases just assumed, there is somewhere a particular case where the merits and demerits of the two systems nearly or quite fully compensate each other. In such cases the question which system should be adopted is one which cannot be answered off-hand or by one person alone. It is necessary to study both the financial and engineering features, possibilities and limitations of the case, first with one system and then with the other. It is a question for the intelligent manager of the railroad company in connection with the intelligent engineer to decide together. They then doubtless will have to call into their confidence Mr. Scott and Mr. Potter and other representatives of the manufacturers, to furnish them the proper information as to the possibilities available in any electrical or mechanical way by means of the different kinds of apparatus. Knowing these different factors, and estimating the value of the different elements in terms of money, the equation of dollars and cents quickly indicates the system which will give the best return on the investment in the particular case. I think this was what Mr. Potter meant. I think that both Mr. Potter and Mr. Scott will agree with me when I say that the fitness of any system is sooner or later determined by substantially this same process.

Mr. Hall: In connection with this subject I will say that I rode on a single-phase railway a few months ago—I think this may have some bearing upon Mr. Beggs' question—and it took some four hours to make a trip which would, with

the direct-current motor, not have taken more than about two hours. That was due to the speed of the car in ordinary running and also due to a lack of acceleration. The time it took to start was a great deal longer than to start on direct current. That is one of the difficulties which has been experienced and has possibly been overcome. My experience occurred a few months ago on a single-phase road, and I understand that the road is now in perfect operation and supposed to be satisfactory.

In connection with Mr. Potter's paper I wish to refer to one paragraph, in which he says: "To meet the requirements of the higher voltage now more commonly used, and to further insure the stability of the motor as regards flashing, it is now the practice to provide a greater number of commutator segments; that is, the voltage difference per commutator bar has been reduced to a lower figure." That paragraph in itself seems to my mind somewhat misleading. It seems to say that increasing the number of commutator bars in a given machine will reduce the liability to flashing. I beg to take some exception to that paragraph if I interpret it correctly, because a given motor with the one-turn winding, having 150 bars, would probably be a much poorer motor if it had 200 bars. Its motor power would be increased before its armature increased. Consequently, I should put this paragraph in just the opposite sense, and say if you reduce the number of commutator bars in a given machine that you improve the commutation because you reduce the reaction and increase the time of commutation. The bars I should leave out. That may have some bearing, but at the same time the motor could be improved by having the bars reduced.

Mr. W. B. Potter: In order that my paper might not be too lengthy, I have perhaps stated a number of facts without giving sufficient reasons therefor. The commutation is not influenced by the width of the commutator segment to the same degree that it is by the voltage between segments and the

speed of the armature. The so-called sparkling of a motor is the arc visible at the instant the segment leaves the brush. Incidentally by increasing the number of segments with a given winding two beneficial results, as affecting commutation, are secured; an armature having a lower speed and a commutator in which there is less difference of potential between adjacent segments.

Mr. Beggs: When the alternating-current motor runs as a direct-current motor, is the acceleration as good as the standard direct-current motor?

Mr. Scott: The rate of acceleration in the motor depends upon the rate of application of higher voltage to the motor; in other words, at the rate at which the controller is thrown on. The rate of acceleration on the alternating-current motor in some cases has been slow, because the controller was thrown on slowly. For example, on the Indianapolis road, if the controller handle, which is adapted to both direct and alternating current, should be turned at the same rate, it happens to give a much lower rate of acceleration on alternating current than on direct current. In order to get the same acceleration in the case of alternating current the controller should be moved faster. Some of the earlier motormen, who were accustomed to operate on direct current, operated in the same way with the alternating current, and got a slower acceleration for that reason. When the rate of the acceleration of the controller was increased the rate of acceleration of the car was increased also. Regarding the point brought up a moment ago in which a visit to some road somewhere was made and conditions were found which were not equal to those on roads operated by direct current, I presume that reference was made to the Indianapolis road. I visited that road a number of months ago, and found that the schedule was as about stated, it took four hours to make the round trip, where two hours ordinarily would be plenty, but I did not care to go any faster than we were running. The road had been laid in

the winter time, and the original contour of the ground was somewhat rolling and the car rolled also. This had one very good effect, which was in the bow-trolley. The bow-trolley had some three feet of length of contact, and the car rolling back and forth made contact sometimes at one point and sometimes at another; and had an oscillation of some two feet or three feet. That was all right until the car tipped so far over the other side that the trolley left the trolley wire, and then there was apt to be trouble. That has been straightened out and things are running smoothly now at 60 m.p.h.

Mr. Mailloux: I want to refer to a point not mentioned in the discussion, namely: the reference to artificial ventilation mentioned by Mr. Potter. I am glad to have that point mentioned by Mr. Potter, as I consider it very important, perhaps one of the points of greatest importance to street railway men at the present time. All street railway men are familiar with over-heated motors, especially when they find themselves compelled to add another trailer to an overworked motor that is already hauling one or two trailers. They find that the motors are over-worked to the point where the poor things have to give up the ghost. In many cases where the practice of adding trailers, which though always reprehensible, is nevertheless often unavoidable, palliative measures are sought through the means of artificial ventilation; and if no extensive use of this means has yet been practically made, it is because it has not yet been developed sufficiently. I took up the matter with my associate, Mr. Gotshall, some years ago, out of necessity. We found ourselves compelled to resort to artificial motor ventilation, because we feared that we could not obtain the desired schedules on the New York & Port Chester Railroad without it, since the largest motors then on the market were not of sufficiently large size. Since that time larger and better motors have been made, and it may not be necessary to resort to artificial ventilation when we get running, but the attention we gave the subject at that time showed conclusively that the

same methods which we had in view could be successfully applied in many other cases.

I have been surprised in talking to street railway men, to find the great necessity which actually exists for artificial motor ventilation. I am glad, therefore, to have the manufacturers who have good facilities for developing such methods as that take hold of it and see what can be done. I fear ventilation cannot be successfully accomplished by means of ventilating fans. I think some means of producing a current of air having a greater pressure than is obtained from fans will be necessary in the majority of cases. We contemplate using, first, the exhauste from the air brakes, and secondly, a direct air stream taken from the auxiliary air brake tanks, which would mean simply that the air compressor would have to be made of somewhat larger capacity, in order to afford sufficient air for ventilation, in addition to that required for the air brake. I hope that even the ventilating fan will succeed, as it possibly will, for very large motors. In the case of small motors under street cars I think it would be useless; but it is interesting to find that efforts are going to be made in that direction.

Mr. Scott: It has been suggested that I call attention to those who may be interested in this subject to an article in the Electric Journal, written by Mr. Jackson, one of my colleagues. He has been intimately concerned in the design of the apparatus and therefore speaks authoritatively in regard to the details to be described. Copies of the September Electrical Journal are on the Secretary's table.

President Ely: At the last convention Major E. D. Meier, who is connected with the American Diesel Engine Company, made an oral statement concerning that very interesting gas engine. He is here today to kindly advise us as to what progress has been made with the engine during the past year.

Mr. E. D. Meier: I do not think it will be necessary before this audience to repeat the details of construction of the Diesel

engine, as the description is published in your proceedings as I gave it last year, but I will simply say in general for those not familiar with it that it is a heat engine which approximates nearer than any other heat engine or device to the Carnot's cycle and thereby verifies his prediction that the greatest economy would thereby be obtained.

When I had the honor of addressing you last, we had only a few of these engines in use, mostly small ones. Since then our product has been of the largest sizes we have yet manufactured, 225 h.p. We had three of these on exhibition at St. Louis last year which ran there for seven months operating the power and lighting system of the German Tyrolean Alps. They have since been placed in different localities and are operating successfully in such places. Two of the same size were placed in the Sherman Electric Company works at Sherman, Texas, and are running there successfully on Texas crude oil. We have been operating them about six months and the report is that the fuel cost of the current is about one-eighth of that in other plants of the same parties operated by steam engines, in all cases, using Texas oil. We have further developed a larger unit by putting two of these 225 h.p. engines together with dynamo direct-coupled between and relieved them of the duty of running their own compressors, thereby getting a 500 h.p. unit. One such has been successfully running for a short period in the works of the Sheboygan and Elkhart Lake Railway Company, at Elkhart, Ind. Another is being put in, in the silver and plate works of the Kimberly Clark Paper Co., and one of the same construction is running in the Baldwin Locomotive Works, where I hope all of you gentlemen will see it, as I have no doubt you will visit the works, as being among the most interesting in the city. We have been running another engine of 225 h.p. for two months at Laconia, N. H., where it is operating the street railway service among other things.

We have now almost everything in the application of

power successfully covered by the Diesel engine. Among other things the Russian company has had in service during the past year a boat which runs over the Volga River and canals between St. Petersburg and the Baku Oil districts. This is operated by three Diesel Engines of 120 h.p. each, driving a generator and running the screws by means of electric motors. This has proven a satisfactory system of control.

There is one point which I would like to bring out, gentlemen, and that is the question of size. We are often asked when speaking of our engines, "Why don't you build them larger?" Everyone seems to think that we need a very large engine. The cause of this question is that for several cogent reasons you think in large units when speaking of steam engines. One is no doubt the amount of space required, which you reduce materially by putting in a large engine, the other is the necessary attention in running and the details of construction, auxiliary machinery, etc., necessary to produce the highest results in economy which can only be done in large units in either steam engine or steam turbine. That is not the case with the Diesel engine. It is true we have a small increase in economy, between the 30 h.p. and the 250 h.p., but this is so small a percentage of the high economy we have in every size that it is not worth considering and is simply due, in my estimation, to better mechanical construction which is possible in the larger engine and of course reduces the internal frictions, but has a minimum effect on the thermal process on which this phenomenal economy is based.

In regard to the matter of space, the Diesel engine equipment, even in the sizes we now have, will require less floor space than the boiler equipment of the steam plant, whether you use steam engines or steam turbines.

Then you certainly have one disadvantage in every large unit in a steam plant, and that is when your peak load comes on, and you may have several peak loads during the day, and it is a question when you shall throw on another one of the

larger engines. If thrown on for but one-half or one-quarter load it has no economy. I have heard gentlemen advocating placing a comparatively small steam engine of about 250 h. p. to help out in just such cases and make it a simple engine with no complications and no economy. In the case of the Diesel engine you can put in your unit, say 500 h.p. and you will have good economy running with full load at 500 h.p. or with half load at 250 h.p. throw the engine in and in a minute and a half you come to full power. The engines will be at full power as quickly as a dynamo can build up its current.

One matter has been extensively discussed here for long distance lines, the question of using either the direct current or alternating current motors. The Diesel engine affords a solution of the problem which will fit either case. Wherever the exigencies of the case dictate the distance apart for the location of your sub-stations, put in a Diesel engine sub-station and it will require no more attention, in fact the attendance will be less, because you have no steam boilers to take care of, and the man who can attend to the dynamo may equally well attend to the Diesel engine. That is a solution which will appeal to every one of you, and you have in that engine 250 or 500 h.p. with an economy higher than you can get from any other form of prime mover. We make one universal guarantee, which is a service guarantee. We do not expect you to adopt the engine on the basis of what it does under test conditions. But we give you a guarantee of the consumption of fuel oil or crude oil per 100 h.p. hours, measured by accurate instruments at any time during the year, and you have the advantage of determining whether the guarantee is kept, within a half hour at any time. You do not have to go to the expense of procuring costly instruments and apparatus but, with a small calibrated tank to measure the oil you can tell in fifteen minutes whether the guarantee is being held or not, by simply measuring the oil and reading the volt and ammeters.

RESOLUTION RELATING TO STANDING  
COMMITTEES.

Mr. W. E. Harrington: Mr. Chairman, I offer the following resolution:

RESOLVED, That all regular standing committees of this Association shall hereafter consist of three members.

The resolution was unanimously adopted.

REPORT OF THE COMMITTEE ON STANDARD  
RULES.

The secretary presented the following report of the Committee on Standard Rules:

The Standard Rules Committee respectfully submit the following report:

1st. At the instance of the Committee, the Secretary sent out a circular to all of the members of the Association, requesting suggestions applicable to the last report of the Committee, and together with any ideas which would enable the Committee to make further progress in their work. The replies received indicated to the Committee that the rules governing city lines have, to a large extent, been adopted.

2nd. The Committee find a diversity of opinions and ideas in relation to rules for the government of interurban lines, and they recommend that the rules adopted by the American Railway Association for the operation of steam railroads, which are the result of years of study and experience, be adopted by interurban lines as far as practicable; and we further recommend that the Secretary of this Association furnish to each member a copy of those rules, and that the members of the Association inform the Standard Rules Committee as to the application of those rules to the lines which they operate, making such suggestions and recommendations to the Committee as will be of value in the prosecution of its work.

The Committee further recommend that the work of the

Standard Rules Committee be continued and that at least two members of said Committee shall be operators of or familiar with the operation of interurban lines.

E. G. CONNETTE,  
W. E. HARRINGTON,  
ROBT. McCULLOCH,  
JOHN J. STANLEY.

Mr. W. Worth Bean: I move that the report be adopted. (Motion seconded and carried).

RESOLUTION RELATING TO SECRETARY  
PENINGTON.

Mr. John I. Beggs: Mr. President, the committee appointed by the Executive Committee to prepare a proper expression of the feelings of the Association for our Secretary, begs to submit this report and suggests that a copy of the resolutions be suitably engrossed and presented to Mr. Penington when adopted.

Mr. Thomas C. Penington, who has been the Secretary and Treasurer of the American Street Railway Association for ten years past, having severed his official relation because of the determination of the Association to establish headquarters in the City of New York, and the necessity of continuous attention to its affairs by the Secretary, therefore be it

RESOLVED, That the American Street Railway Association does hereby record a minute of its earnest appreciation of Mr. Penington's fidelity to its interests, his devotion to its welfare and the eminently honest and satisfactory manner in which he has discharged the trusts imposed upon him.

Mr. Penington's relations to the individual members of the American Street Railway Association have established a friendship which will last through life, and they part with his services as an officer with the deepest regret and with a lasting appreciation of his kindly thought and attention to them-



SECRETARY AND TREASURER 1895-1905  
T. C. PENINGTON, TREASURER  
CHICAGO CITY RAILWAY CO.  
CHICAGO, ILL.





T. Peny'la



selves and their friends during the many Conventions which have been held under his able assistance.

JOHN I. BEGGS,  
C. G. GOODRICH,  
W. E. HARRINGTON.

On motion the resolutions were unanimously adopted.

Thomas Clark Penington was born in Delaware, in 1844. At seventeen while still at school he enlisted in the Thirty-sixth Regiment Illinois Volunteers and served four years in the army, being one of Sherman's "Bummers" and joining in the "March to the Sea."

After his discharge from the army, Mr. Penington devoted his time to mercantile business until the spring of 1873, at which time he entered the employ of the Chicago City Railway Company as a clerk in the office of the Superintendent. Shortly afterwards he was promoted to a clerkship in the Treasurer's office,—and in 1883 was elected Treasurer of the Company, which position he still holds.

At Montreal, in 1895, Mr. Penington was elected Secretary and Treasurer of the American Street Railway Association. He relinquished this position this year, the Association deeming it best to have a permanent office in New York City.

Mr. Penington is a Knight Templar, a Thirty-two Degree Mason, Shriner, and a member of the Grand Army of the Republic.

#### RESOLUTION RELATING TO COMPENSATION FOR CARRYING UNITED STATES MAIL.

Mr. John I. Beggs: A committee of this Association has existed for some years upon the matter of rates paid by the Government for mail service on electric lines. That Committee has done nothing during the past year, and I believe that two members of the committee are not here. I therefore offer the following resolution:

RESOLVED, That a Committee of three active members of this Association be appointed to present to and urge

upon the Hon. Postmaster General and the Hon. Committee on Postal Affairs of the Congress of the United States the necessity of allowing and providing for much larger compensation for carrying mails on Street and Interurban Railways both for Postal Cars and Pouch Service and likewise the necessity of modifying the conditions under which such service is performed.

Mr. C. O. Mailloux: I second the motion, provided Mr. Beggs adds "appointed by the President."

Mr. Beggs: I accept the amendment.

(The resolution was unanimously adopted).

#### COMMITTEE ON UNITED STATES MAIL SERVICE.

President Ely: I will appoint as a committee on United States Mail Service the following gentlemen: John I Beggs, of Milwaukee; G. Tracy Rogers, of Binghamton, and P. F. Sullivan, of Boston.

#### C O M M I T T E E   O N   S T A N D A R D   R U L E S .

As the Committee on Standard Rules, the Chair will appoint the following gentlemen: E. G. Connette, of Worcester; Richard McCulloch, of St. Louis, and E. C. Faber of Wheaton, Ill.

#### C O M M I T T E E   O N   F I R E   I N S U R A N C E .

As a Committee on Fire Insurance, the Chair will appoint the following gentlemen: H. J. Davies, of Cleveland; E. W. Olds, of Milwaukee, and T. C. Penington, of Chicago.

#### R E P O R T   O F   C O M M I T T E E   O N   R E S O L U T I O N S .

Mr. C. Loomis Allen: As Chairman of the Committee on Resolutions, I desire to offer the following:

#### R E S O L U T I O N   O F   T H A N K S   T O   T H E   M A N U F A C T U R E R S '   A S S O C I A T I O N .

WHEREAS, The American Street Railway Manufacturers' Association, has assembled and placed for examination

the most complete, excellent and interesting exhibit of railway appliances ever shown at any previous Convention, and

WHEREAS, The arrangement of the exhibits, with respect to the artistic effects, as well as with regard to convenience and facility for examining them, gives evidence of the most careful and painstaking thought, and

WHEREAS, The social and entertainment features provided by the American Street Railway Manufacturers' Association have been most carefully planned and carried out. Now,

THEREFORE, Be it RESOLVED, that the American Street and Interurban Railway Association place on record its appreciation and thanks to the American Street Railway Manufacturers' Association, its Officers, Executive Committee, and its Members, collectively and individually, for their energetic and tireless efforts in producing these most successful results.

#### RESOLUTION OF THANKS TO THE PHILADELPHIA RAPID TRANSIT COMPANY.

WHEREAS, The members and guests of the American Street and Interurban Railway Association are under very great obligations to the Officers and Staff of the Philadelphia Rapid Transit Company for numberless courtesies and attentions, including complimentary transportation on the street railway system of the city and suburbs, facilities for examining the many interesting features of the system, and particularly for the installation, at considerable trouble and expense, of a complete section of track in the Exhibition Hall:

THEREFORE, Be it RESOLVED that this Association extend to Mr. John B. Parsons, President of the Philadelphia Rapid Transit Company, and to the Officers and Heads of Departments of that Company, its hearty thanks and appreciation for these many attentions and privileges.

RESOLUTION OF THANKS TO THE PHILA-  
DELPHIA AND WEST CHESTER  
TRACTION COMPANY.

WHEREAS, The Philadelphia and West Chester Traction Company, has extended to the members and guests of the American Street and Interurban Railway Association many attentions including complimentary transportation over its Street Railway lines;

THEREFORE, Be it RESOLVED, that this Association hereby express its thanks and gratitude to the Officers of the Philadelphia & West Chester Traction Company for their courtesies.

RESOLUTION OF THANKS TO THE PASSENGER  
RAILROAD ASSOCIATION.

WHEREAS, The Passenger Railroad Association has extended to the Delegates in attendance at this Convention, a special transportation rate of a fare and one-third from all points to Philadelphia,

THEREFORE, Be it RESOLVED, that the American Street and Interurban Railway Association hereby acknowledge these courtesies and expresses its appreciation of the same.

RESOLUTION OF THANKS TO DR. W. P. WILSON.

WHEREAS, Dr. W. P. Wilson, Director of the Philadelphia Commercial Museum, has extended every courtesy and very material assistance in the installation and preparation of the exhibits in connection with this Convention,

THEREFORE, Be it RESOLVED, that the American Street and Interurban Railway Association hereby places on record its cordial thanks to Dr. Wilson for the part he has played in making the exhibit feature a success.

RESOLUTION OF THANKS TO THE ENGINEERS'  
CLUB AND THE MANUFACTURERS' CLUB.

WHEREAS, The members and guests of the American

Street and Interurban Railway Association have been accorded club privileges and courtesies at the Engineers' Club, the Manufacturers' Clubs, and the Southern Club during the Convention in this City;

THEREFORE, Be it RESOLVED, that this Association acknowledge these courtesies and hereby express its appreciation of these privileges.

RESOLUTION OF THANKS TO MAYOR WEAVER  
AND TO PHILADELPHIANS.

WHEREAS, This Convention has been one of the most successful ever held in the history of the Street Railway Industry;

THEREFORE, Be it RESOLVED, that the hearty thanks and sincere gratitude of the American Street and Interurban Railway Association be offered to Mayor John Weaver; to the citizens of the City of Philadelphia; to the Local Press; to the Local Entertainment and Reception Committees; to the Hotels; to the Local and Long Distance Telephone and Telegraph Companies; to the Local Post Office Officials, and to all the Civic, Social and Business interests of the City of Philadelphia, who have contributed in so large measure to the success of this meeting.

The foregoing resolutions are respectfully submitted for your consideration and action.

C. LOOMIS ALLEN,  
JOHN A. RIGG,  
W. A. SMITH,  
Committee.

VOTE OF THANKS TO AUTHORS OF PAPERS.

Mr. W. E. Harrington: Mr. President, I offer the following resolution:

RESOLVED, A vote of thanks of the Association be extended the authors of the very interesting and valuable papers presented at this Convention.

Be it RESOLVED further that this Association appreciates the courtesy of the manufacturers in permitting the preparation of the character of papers presented and the attendance of their experts in connection therewith.

All the resolutions were unanimously adopted.

Mr. W. Worth Bean: Mr. President, I offer the following resolution:

WHEREAS, The Accountants' Association will be in session until Saturday afternoon Sept. 30th, 1905.

RESOLVED, That this Association do now take a recess until the close of the last session of said Accountants' Association at which time, this Association will stand adjourned *sine die*,

(The resolution was carried.)

President Ely: The Mechanical Association has designated as its member of the Executive Committee of the parent Association, Mr. H. H. Adams, its President; the Claim Agents' Association has designated Mr. S. L. Rhoades as its member; the Accountants' Association will designate its member tomorrow or the next day, and then the Executive Committee will be fully constituted under the new rules and ready for work.

As has been the case already, the Chair is very much indebted to every one for the very courteous treatment that has been accorded to him. I congratulate you all upon the success of this convention. The convention will stand over until Saturday afternoon, at 5 o'clock when, after the adjournment of the Accountants' Association, this Association will be duly adjourned, *sine die*.

#### REPORT OF THE COMMITTEE ON MEMORIALS.

Messrs. Calvin G. Goodrich, John I. Beggs and Frank G. Jones who were appointed a Committee on Memorials by President Ely at the meeting of the Executive Committee, filed the following report:

**FREDERICK COOK.**

Frederick Cook, President of the Rochester Railway Company of Rochester, N. Y., died at his home in that city on February 17, 1905, in his seventy-third year.

Mr. Cook was born in Germany and came to this country as a penniless immigrant at fifteen years of age. At seventeen he became identified with railroad interests, when he was a conductor on the New York Central and Hudson River Railroad. He amassed a fortune, and was connected in an official position with a large number of prominent Rochester companies.

Mr. Cook is survived by a widow and children.

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**FRANK MURPHY.**

Frank Murphy, President of the Omaha and Council Bluffs Railway Company, of Omaha, Nebraska, died in New York City on December 12, 1904, in his sixty-fourth year.

Mr. Murphy was born at Wheeling, West Virginia, and was educated in Pittsburgh. He settled in Omaha in 1857, and was prominently identified with political affairs in Nebraska. He became President of the Omaha Horse Railway Company in 1883, and was identified with the property through the various changes which took place since that date.

Mr. Murphy had never married.

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**JOHN OLMS TED.**

John Olmsted, President of the Springfield Street Railway Company, of Springfield, Mass., died in that city on April 6, 1905, in his eighty-fifth year.

Mr. Olmsted was born in Enfield, Conn., the son of a farmer. Until the age of forty he remained at Enfield as a manufacturer and dealer in tinware and paper stock. In 1860

he removed to Springfield. He was elected a Director of the Springfield Street Railway Company in 1872 and its President in 1876, and developed the property into a great success. He was also interested in other street-railways in the East, as well as a large number of manufacturing enterprises.

Mr. Olmsted is survived by one daughter and four grandchildren.

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#### WILLIAM WHITE.

William White, Claim Agent of the Chicago City Railway Company died at his home in Chicago on March 5, 1905, after an illness of ten days.

Mr. White came to Chicago in 1884 and entered the employ of the Company as a conductor, advancing through several official positions until he became head of the claim department.

He was a member of the Executive Committee of the American Association of Street Railway Claim Agents and was actively interested in its promotion and organization at St. Louis last year.

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#### CHARLES ROBERT PENINGTON.

Charles Robert Penington, son of T. C. Penington, Secretary of the American Street Railway Association, died at Phoenix, Arizona, November 30, 1904. The interment took place in Oakwood Cemetery, Chicago, December 5, 1904.

Mr. Penington was paymaster and cashier of the Chicago City Railway Company and had been in the employ of the Company for more than twenty years. His death was the result of a very heavy cold contracted a year previously.

He leaves a widow and two children.

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## THE EXHIBIT.

The Manufacturers' Association spared no pains to make the exhibit at the Philadelphia Museum, the most comprehensive and artistic of any held under the auspices of the association. The draping of the booths, the railings separating them and the general pleasing effect produced by the arrangement of each individual exhibit, were especially noticeable. The number of exhibitors was greater than in any of the previous years and the exhibits were all of much more comprehensive character than at any previous convention.

The Southern pavilions of the Philadelphia Museum in the adjoining building of large area, were used as exhibition halls and they were found most admirably adapted to that purpose. They contained approximately 75,000 square feet of floor space and were well lighted and ventilated. These halls are located on 34th Street near South Street within fifteen minutes of the City Hall; are easily accessible and afford excellent facilities from a shipping stand-point, having a switch direct (Pa. Railroad) which enters the building with 500 feet of track under cover.

There was also ample room outside of the buildings for outdoor exhibits with two railroad tracks, one 600 feet long and the other 400 feet long. Arrangements were made for such electric power as was necessary for the various exhibits.

All exhibits were under the direct charge of Mr. William Wharton, Jr., local Chairman, and Mr. George Keegan, acting as secretary. Mr. Thomas K. Bell was director of the exhibit and was in immediate charge of all details.

The headquarters of the Committee on exhibits was at the main entrance of the Southern pavilion.

An innovation at this convention was made by the Bell Telephone Company, which Company put in telephones at the various exhibits with exchange service and any number of local calls during the life of the exhibition at a cost of \$12.00;

long distance calls being extra. This innovation was found to be very serviceable to the members of the convention.

Another new feature added to the Executive Committee's work by the suggestion of Chairman Brady of the Manufacturers' Association, was the idea of inviting all steam railroad officials to attend the exhibition. About 5,000 invitations were mailed and there were a considerable number of representatives of this branch of the traction art in attendance.

### EXHIBITORS.

Acme Automatic Street Indicating Co.	Barbour Stockwell Co.
Adams & Westlake Co.	Beckwith-Chandler Co.
Albert & J. M. Anderson Mfg. Co.	Benjamin Electric Mfg. Co.
Allis-Chalmers Co.	Berry Bros.
American Automatic Switch & Frog Co.	Blake Signal & Mfg. Co.
American Book Bracket Co.	Blanchard Ry. Switch Lock Co.
American Brake Shoe & Foundry Co.	Bliss, E. W., Co.
American Car Co.	Borgner, Cyrus.
American Carbon & Battery Co.	Brady Brass Co.
American Car & Foundry Co.	Brill, J. G., Company.
American Car & Ship Hdw. Co.	Brower, Irving B. & Son.
American Ferrofix Brazing Co.	Brown, Harold P.
American Locomotive Co.	Buckeye Engine Co.
American Locomotive Sander Co.	Buda Foundry & Manufacturing Co.
American Railway Supply Co.	Bullard Automatic Wrench Co.
American Steel & Wire Co.	Carnegie Steel Co.
Atha, Benj., Co.	Chicago Pneumatic Tool Co.
Atkins, E. C., & Co.	Chicago Varnish Co.
Atlanta Car Wheel & Mfg Co.	Clark Electric & Manufacturing Co.
Atlas Railway Supply Co.	Cleveland Frog & Crossing Co.
Automatic Ventilator Co.	Coe, W. H., Manufacturing Co.
Baeder, Adamson & Co.	Coin Counting Machine Co.
Baldwin Locomotive Works.	Columbia Machine Works & M. I. Co.
Baldwin & Rowland Switch & Signal Co.	Continuous Rail Joint Co.
Baltimore Waste Co.	Consolidated Car Heating Co.
	Consolidated Car Fender Co.
	Cook's Sons, Adam.
	Creaghead Engineering Co.

Crocker Wheeler Co.  
Crouse-Hinds Co.  
Curtain Supply Co.  
Dayton Mfg. Co.  
Dearborn Drug & Chemical Works.  
Decatur Car Wheel & Mfg. Co.  
De Ronde, Frank S.  
DeWitt Sand Box Co.  
Dilworth-Porter Co.  
Dixon, Jos. Crusible Co.  
Dossert & Co.  
Dressel Railway Lamp Works.  
Duquesne Steel Foundry Co.  
Duplicate Transfer & Rebate Co.  
D. & W. Fuse Co.  
Duff Manufacturing Co.  
Durkin Controller Handler Co.  
Earll, Charles I.  
Eclipse Railway Supply Co.  
Edwards Co., O. M.  
Egry Autographic Register Co.  
Electrical World & Engineer.  
Electric Appliance Development Co.  
Electric-Dynamic Co.  
Electric Railway Equipment Co.  
Electric Storage Battery Co.  
Elliot Switch & Frog Co.  
Empire Safety Tread Co.  
Eureka Automatic Electric Signal Co.  
Falk Co., The.  
Fay, J. A. & Egan Co.  
Felt & Tarrant Mfg. Co.  
Flood & Conklin.  
Franklin Railway Supply Co.  
Galena Signal Oil Co.  
Garton-Daniels Co.  
General Electric Co.  
George S. Hastings.

Gould Storage Battery Co.  
Gold Car Heating & Ltg. Co.  
Goldschmidt-Thermit Co.  
Globe Ticket Co.  
Grassberger, L. B.  
Griffin Wheel Co.  
Hale & Kilburn Mfg. Co.  
Harrison Safety Boiler Works.  
Heine Safety Boiler Co.  
Herrick, Albert B.  
Hildreth Varnish Co.  
Hunt, C. W., Co.  
Indestructible Fibre Co.  
Indianapolis Switch & Frog Co.  
Ingersoll, Frederick.  
International Register Co.  
International Sprinkler Co.  
Jewett Car Co.  
Johns-Manville Co., H. W.  
Jolt Lubricator Co.  
Jones & Laughlin Steel Co.  
Kalamazoo Railway Supply Co.  
Kenfield Publishing Co.  
Kuhlman, G. C., Car Co.  
Lagonda Manufacturing Co.  
Latrobe Steel Co.  
Lawrence & Wiggin.  
Lehigh Car Wheel & Axle Co.  
Leonhardt Wagon Mfg. Co.  
Ley, Fred. T., & Co.  
Lobdell Car Wheel Co.  
Lorain Steel Co.  
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Lord Co., Geo. W.  
Lucas & Son, John.  
Lumen Bearing Co.  
Lupton's Sons Co., David.  
McCardell & Co., J. R.  
McGraw Publishing Co.  
McGuire-Cummings Mfg. Co.  
McRoy Clay Works.  
Manning, Maxwell & Moore.  
Manufacturing Co.

Maryland Steel Co.  
Massachusetts Chemical Co.  
Matthews, W. N., & Bro.  
Masury, John W., & Son.  
Mayer & Englund Co.  
Merrill Stevens Mfg. Co.  
Merritt & Co.  
Mesta Machine Co.  
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Moore, Alfred F., & Co.  
Morris Co., E. P.  
Murphy Varnish Co.  
National Brake Co.  
National Carbon Co.  
National Car Wheel Co.  
National Electric Co.  
National Lock Washer Co.  
New York Switch & Crossing Co.  
Niles Car & Mfg. Co.  
Nolty & Co.  
Nuttall Co., R. D.  
Ohio Brass Co.  
Ohmer Fare Register Co.  
Oil & Waste Saving Machine Co.  
Okonite Co.  
Oliver Machinery Co.  
Osborn Conduit Co.  
Pantasote Co.  
Parker Boiler Co.  
Parmenter Fender & Wheel Guard Co.  
Parrott Varnish Co.  
Partridge, Arthur S.  
Peckham Manufacturing Co.  
Peerless Rubber Mfg. Co.  
Pennsylvania Steel Co.  
Pettingill-Andrews Co.  
Philadelphia Air Brake & Machine Co.  
Philadelphia Rapid Transit Co.  
Philadelphia Toboggan Co.  
Pittsburg Insulating Co.  
Pittsburgh Reduction Co.  
Platt Iron Works Co.  
Porter & Berg.  
Post-Office.  
Pratt & Lambert.  
Pressed Steel Car Co.  
Prosser & Son, Thomas.  
Railway Age.  
Railway Appliances Co.  
Railway Journal Lubricating Co.  
Railway Mutual Indemnity Co.  
Railway Steel Spring Co.  
Rand-Avery Supply Co.  
Recording Fare Register Co.  
Ridlon, Frank, Co.  
Riverside Metal Co.  
Rossiter, McGovern & Co.  
Schoen Steel Wheel Co.  
Schubert, F.  
Security Registry Co.  
Sherwin-Williams Co.  
Silver, W. S. & Co.  
Simmons Co., John.  
Smith Heater Co., Peter.  
Southern Exchange Co.  
Speer Carbon Co.  
Standard Automatic Lubricator Co.  
Standard Paint Co.  
Standard Railway Track Appli- ance Co.  
Standard Steel Works.  
Standard Underground Cable Co.  
Standard Varnish Works.  
Star Brass Works.  
Stedman, J. H.  
Stephenson, John, Co.  
Sterling-Meaker Co.  
Sterling Varnish Co.  
Stiles, A. C., Anti-Friction Metal Co.

St. Louis Car Co.  
St. Louis Car Wheel Co.  
Street Railway Bulletin.  
Symington, T. H., Co.  
Taylor Electric Truck Co.  
Taylor Iron & Steel Co.  
Tomlinson Coupler Co.  
Trolley Electric Vehicle Co.  
Trolley Supply Co.  
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Western Electric Co.  
Westinghouse Companies.  
Weston Electrical Instrument  
Co.  
Wheel Truing Brake Shoe Co.  
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Wood, Chas. N., Electric Co.  
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Yale & Towne Mfg. Co.

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Alfred K. Warren	C. S. Judson
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James Humes	
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W. A. Taxis	Charles Longstreth
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 Grant W. Spear  
 W. B. McVicar

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 C. G. Dickinson  
 A. T. Holley  
 J. G. Satterthwait

**Dewitt Sandbox Co.**

E. F. Dewitt  
 Charles H. Parks

**Dilworth Porter Co.**

L. Dilworth  
 A. Morrison  
 W. F. Scheleter  
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**Dixon Crucible Co., Jos.**

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 John J. Tucker

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W. S. Taylor	
<b>D. &amp; W. Fuse Co.</b>	<b>Electro-Dynamic Co.</b>
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M. A. Oberland	H. McL. Harding
W. S. Sisson	Mr. Peck
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T. McKean	F. H. Newcomb
<b>Eclipse Railway Supply Co.</b>	Geo. H. Roberts
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Benjamin Levy	
J. W. Range	
<b>Edwards Co., The O. M.</b>	<b>Eureka Automatic Electric Signal Co.</b>
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O. M. Edwards	John Earler
G. G. Norris	N. W. Souder
<b>Egry Autographic Register Co.</b>	W. D. Zehner
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<b>Electric Appliance Development Co.</b>	<b>Falk Co., The</b>
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<b>Electric Railway Equipment Co.</b>	E. A. Wurster
Herman Brill	
C. H. Camp	
James K. Davis	<b>Felt &amp; Tarrant Mfg. Co.</b>
Ross Forward	T. H. Brown
Horace Kephart	A. J. D. Deberrard
H. F. Sanville	C. L. Metzgar
I. D. Shipper	J. C. Nevins
Augustus S. Vane	
<b>Electric Storage Battery Co.</b>	<b>Flood &amp; Conklin Co.</b>
G. H. Atkin	F. Conklin
Charles Blizzard	L. Conklin
H. B. Gay	H. T. Kuhn
R. C. Hull	I. H. Munford
Edward L. Reynolds	
	<b>Franklin Railway Supply Co.</b>
	C. S. Ayres
	Henry S. Hayward, jr.
	K. D. Hequembourg
	W. N. Matthews
	Paul Weiler

**Galena Signal Oil Co.**

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F. B. Baker  
George A. Barnes  
E. G. Beatty  
L. J. Drake, Jr.  
R. P. Birtell  
A. Green  
Frederick A. Guild  
H. C. Mason  
L. G. Miller  
W. H. Page  
C. A. Record  
C. E. Sedgwick  
J. V. Smith  
C. C. Steinbrenner  
Charles H. Thomas.  
W. A. Trube  
Edward G. Wilson  
John A. Wilson

**Garton Daniels Co.**

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Rush B. Casper  
W. B. Casper  
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J. C. Calisch  
W. G. Carey  
F. E. Case  
H. W. Clapp  
M. M. Corbin  
H. H. Crowell  
F. H. Gale  
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Gen. Eugene Griffin  
G. H. Hill  
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H. N. Ranson  
Geo. P. Rosenthal  
C. E. Sprague  
S. W. Trawick  
W. M. Wright

**Globe Ticket Co.**

J. Elliott  
R. C. Osman  
W. C. Pope  
P. C. Snow  
W. P. Snow

**Gold Car Heating and Lighting Co.**

Oren Deems  
Edward E. Gold  
B. H. Hawkins  
A. E. Robbins  
John E. Ward

**Goldschmidt-Thermit Co.**

B. F. Kelker, Jr.  
E. Stutz

**Gould Storage Battery Co.**

E. J. Glover  
W. S. Gould  
F. W. Hulme  
W. E. Winship

**Grassberger, I. B.**

J. A. Grassberger  
L. B. Grassberger  
Joseph Schutte  
Edward Stolz

<b>Griffin Wheel Co.</b>	W. H. Brown
C. K. Knickerbocker	A. N. Loper
C. P. Kopf	A. L. Woodward
F. Swift	
F. L. Whitcomb	
<b>Hale &amp; Kilburn Mfg. Co.</b>	<b>International Sprinkler Co.</b>
H. T. Bigelow	P. Evans
A. F. Old	A. M. Lewis
B. Pilson	I. D. Pitts
S. A. Walker	J. C. Scott
<b>Harrison Safety Boiler Works</b>	<b>Jewett Car Co., The</b>
R. H. Eisenbrey	E. Besuden
J. C. Jones	C. E. Krebs
R. V. Jones	
R. H. Ramsay	
<b>Hastings &amp; Co., Geo. S.</b>	<b>Johns-Manville Co., W. H.</b>
E. G. Germer	D. T. Dickson
Otto Germer	C. R. Manville
George S. Hastings	J. E. Meek
<b>Heine Safety Boiler Co.</b>	H. M. Voorhis
H. M. Lyman	
Col. E. D. Meiers	
L. G. Neiman	
<b>Herrick, A. B.</b>	<b>Jolt Lubricator Co.</b>
E. F. Bissel	A. W. Harris
E. G. Boynton	A. B. Lisle
E. D. Daniel	T. F. Pevear
A. B. Herrick	
E. J. Picker	
<b>Hildreth Varnish Co.</b>	<b>Jones &amp; McLaughlin Steel Co.</b>
Charles C. Castle	F. M. Campbell
<b>Hunt Engineering Co., C. W.</b>	G. C. Fogwell
David H. Gildersleeve	W. H. Hirsch
A. C. Summers	M. K. Mastick
<b>Indestructible Fibre Co.</b>	<b>Kalamazoo Railway Supply Co.</b>
E. H. Chapin	F. N. Root
E. A. Jorgensen	J. W. Thorn
<b>Indianapolis Switch and Frog Co.</b>	<b>Kenfield Publishing Co.</b>
W. H. Thomas	F. S. Kenfield
<b>International Register Co.</b>	H. J. Kenfield
John Benham	William Padget
	<b>Kuhlmann Car Co., The G. C.</b>
	Samuel M. Curwen
	D. B. Dean
	R. B. Liddell
	F. L. Markham
	<b>Latrobe Steel Co.</b>
	Marriott C. Smyth
	W. W. Turlay
	C. C. Warren
	E. O. Warren

<b>Lawrence &amp; Wiggins</b>	Daniel Coolidge
George H. Damon	F. J. Drake
Frank W. Lawrence	S. P. S. Ellis
<b>Lehigh Car Wheel &amp; Axle Works</b>	H. C. Evans
W. A. Smithers	H. B. Frye, Jr.
B. F. Swartz	W. W. Kingston
<b>Leonhardt Wagon Co.</b>	H. F. A. Kleinschmidt
George F. Faust	A. S. Littlefield
John H. Leonhardt	S. P. McGough
E. C. Matlock	S. H. Merrill
William Mylander	H. C. Stiff
<b>Ley &amp; Co.</b>	E. P. Thomas
Fred T. Ley	<b>Lucas &amp; Co., John</b>
<b>Lobdell Car Wheel Co.</b>	F. G. Elliott
Fred Lex	F. H. Lovejoy
George G. Lobdell, Jr.	J. Lucas
W. W. Lobdell	E. C. Monroe
Charles F. Wollaston	<b>Lumen Bearing Co.</b>
<b>Lagonda Manufacturing Co., The</b>	H. R. Forbes
Charles Day	Edward P. Sharp
George Greenwood	<b>Lupton Sons Co., David</b>
L. B. Mellor	D. D. Lupton
H. J. Weinland	E. L. Lupton
<b>Lord Co., Geo. W.</b>	J. W. Watkins
L. P. Clark	E. T. Wilkinson
J. D. Doughty	<b>McCardell &amp; Co., J. R.</b>
<b>N. P. Lane</b>	M. J. McDonald
V. O. Lawrence	Joseph Hoez
<b>Lord Electric Co.</b>	C. H. West
George B. Crane	Oscar F. Wood
W. R. Garton	<b>McGraw Publishing Co.</b>
Edwin M. Hamlin	H. B. Abbott
E. J. Hudders	C. A. Baptiste
H. M. Shaw	H. W. Blake
George W. Smith	H. S. Buttenheim
<b>Lorain Steel Co.</b>	E. V. Clark
P. M. Boyd	J. R. Cravath
Carroll Burton	C. B. Fairchild, Jr.
R. Clitz	<b>McGuire, Cummings Mfg Co.</b>
	W. J. Cooke
	J. J. Cummings
	W. J. Cummings
	C. H. Wilcox

**Macon-Evans Varnish Co.**

C. Evans, Jr.  
Robert G. Fleming  
L. S. Macon

**Manning, Maxwell & Moore**

J. N. Derby  
G. B. Gosman  
T. G. Keogh  
Frank P. Smith

**Manufacturing Co., The**

W. Brenneman  
J. Hayes  
R. Hayes  
J. M. Reiley

**Maryland Steel Co.**

A. E. Abey  
R. E. Beltnap  
Charles S. Clark  
R. Peters

**Massachusetts Chemical Co.**

S. R. Deiffield  
Louis O. Duelos  
R. T. Elwell  
E. C. Green

**Mayer & Englund Co.**

A. H. Englund  
H. G. Lewis  
T. F. McKenna  
J. McSorley  
C. J. Mayer  
George Smith  
John Smith

**Merrill-Stevens Mfg. Co.**

V. E. Cook

**Merritt & Co.**

R. W. Jeffries  
J. S. Merritt  
Stephen Morris  
A. G. Priestman

**Mesta Machine Co.**

F. E. Brown  
Charles Richardson  
Walter G. Tatnall

**Miller Anchor Co.**

F. B. Miller  
G. H. Miller

**Moore, Alfred F.**

Edwin B. Bartram  
Antone Bournonville  
Alfred F. Moore  
William W. Pawling

**Morris Co., Elmer P.**

W. H. Hinnian  
C. E. Lord  
Elmer P. Morris  
W. E. Sweeten

**Murphy Varnish Co.**

C. M. Baker  
F. O. Brazier  
George F. Kissam

**National Brake Co. Inc.**

G. S. Ackley  
William D. Brewster  
J. A. Edwards  
F. D. Miller  
W. W. Miller  
E. C. Rutherford

**National Carbon Co.**

A. D. Spear  
Arthur E. Carrier

**National Car Wheel Co.**

E. H. Chapin  
George C. Morse  
James D. Rhodes  
John Howard Yardley

**National Electric Co.**

C. G. Burton  
Walter Clayton  
W. R. Crawford  
J. H. Denton  
J. C. Farrow  
W. Farrow  
William H. Goble  
Charles Leet  
J. F. Perry  
F. L. Waters

<b>National Lock Washer Co., The</b>	<b>Oil and Waste Saving Machine Co.</b>
F. B. Achibald	C. B. King
D. S. Hoyt	T. S. Patterson
R. L. Thomas	J. W. Pittock
John Seymour	Mr. Sterling
<b>Niles Car Manufacturing Co., The</b>	<b>Oliver Machinery Co.</b>
J. A. Hanna	R. O. Lovell
F. C. Robbins	<b>Osburn Flexible Conduit Co.</b>
A. W. Schall	W. P. Anobos
<b>Nolty &amp; Co.</b>	C. E. Corrigan
George Nolty	Nathan Lippincott
Henry Nolty, Jr.	Harry Osburn
Louis Nolty	G. Valler
Philip Nolty	<b>Pantasote Co.</b>
<b>Nuttall Co., R. D.</b>	D. E. Bonner
F. A. Estep	H. M. Greer
J. M. Gallagher	John M. High
George V. Provost	<b>Parker Boiler Co.</b>
<b>N. Y. Switch &amp; Crossing Co.</b>	F. S. Chambers
E. Armerding	S. C. Delamater
A. W. Pratt	P. J. McBride
H. R. Sherman	J. C. Parker
W. C. Wood	<b>Parmenter Fender and Wheel Guard Co.</b>
<b>Ohio Brass Co., The</b>	H. P. Ball
R. M. Campbell	N. S. Keay
N. M. Garland	George A. Parmenter
F. H. Jameson	H. H. Parmenter
C. K. King	<b>Parrott Varnish Co.</b>
George A. Mead	A. C. Knapp
A. F. Price	H. R. Parrott
J. E. Slimp	<b>Partridge, Arthur S.</b>
M. P. Walcott	Arthur S. Partridge
A. L. Wilkinson	<b>Peckham Manufacturing Co.</b>
<b>Ohmer Fare Register Co.</b>	J. R. Beetem
Mr. Breen	George Bowers
H. E. Eckert	George Hoadley
W. E. Hinman	William Wampler
C. W. Ketterman	<b>Peerless Rubber Mfg. Co.</b>
J. F. Ohmer	Mr. Bell
J. H. Steadman	W. J. Courtney

F. O. Donnall	Platt Iron Works
J. L. McGelway	Royal K. Fox, Jr.
<b>Pennsylvania Steel Co.</b>	C. S. Munoz
Charles A. Alden	O. G. Smith
S. W. Baldwin	J. H. Waterman
T. Blagden, Jr.	<b>Porter &amp; Berg</b>
Charles D. Clark	Max A. Berg
William C. Cuntz	E. R. Mason
R. W. Gillespie	<b>Pratt &amp; Lambert</b>
H. B. Green	J. Maycock
John T. Hill	<b>Pressed Steel Car Co.</b>
Howard F. Martin	O. C. Gayley
Charles W. Reinoehl	F. N. Hoffstet
J. N. Scherer	Peter M. Kling
G. Smith	J. S. Turner
<b>Philadelphia Air Brake Co.</b>	W. H. Wilkinson
T. F. Kelly	<b>Prosser &amp; Sons, Thomas</b>
F. S. Drake	F. A. Barbev
J. E. R. Lambert	George H. Bryant
W. W. Lambert	H. D. Haight
<b>Philadelphia Rapid Transit Co.</b>	T. Prosser
H. H. Nichols	<b>Railway Age Co.</b>
<b>Philadelphia Toboggan Co.</b>	W. V. Dee
C. E. Albright	M. H. Miner
C. E. Arthur	<b>Railway Appliance Co.</b>
Charles Leopold	George H. Sargent
J. B. Mooney	Edgar M. Smith
<b>Pettingill Andrews Co.</b>	<b>Railway Journal Lubricating Co.</b>
W. J. Keenan	William H. Baumann
Charles B. Price.	C. S. Rae
F. S. Price	Burton R. Stare
<b>Pittsburg Insulating Co.</b>	William H. Stare
P. V. Norvell	<b>Railway Mutual Indemnity Co.</b>
Alfred Pearson	W. B. Mellor
James Todd	W. H. Miller
<b>Pittsburg Reduction Co.</b>	Francis Moorhead
S. K. Colby	J. Craig Shields
E. F. Cheyney	<b>Railway Steel Spring Co.</b>
J. H. Finney	F. F. Fitzpatrick
E. H. Noyes	S. R. Hayes
H. K. Spalding	A. S. Henry
	F. C. McLewer

<b>Rand Avery Supply Co.</b>	C. P. Jarden
James F. Wattles	E. M. Williams
<b>Reagan Grate-Bar Co.</b>	<b>Silver Co., William S.</b>
George Wholey	A. W. Field
<b>Recording Fare Register Co.</b>	William S. Silver
J. Coakley	<b>Simmons Co., John</b>
William Hartland	George A. Hurd
F. B. Kennedy	C. H. Simmons
M. Def. Yates	F. H. Simmons
<b>Ridlon Co., Frank</b>	Joseph Simmons
G. C. Dana	<b>Smith Heater Co., Peter</b>
J. M. Hayes	W. P. Cooper
E. O. Johnson	Peter Smith
H. F. Kellogg	<b>Southern Exchange Co.</b>
<b>Riverside Metal Co.</b>	A. J. McKennan
H. W. Berroth	W. E. Mitchell
C. M. Fogg	R. W. Williams
I. J. Kane	<b>Speer Carbon Co.</b>
W. P. McGlynn	C. Duble
<b>St. Louis Car Co.</b>	G. P. Fryling
W. S. McCall	J. S. Speer
A. H. Sisson	J. G. Wertz
H. F. Vogel	<b>Standard Auto-Lubricating Co.</b>
<b>St. Louis Car Wheel Co.</b>	W. C. Alderson
J. L. Butterfield	E. W. Baird
John J. Morse	G. B. Kirkbride
John W. Nute	W. S. Taylor
W. W. Tolman	<b>Standard Paint Co., The</b>
<b>Schoel Steel Co.</b>	Charles Earnshaw
M. R. Jackson	<b>Standard Steel Works</b>
M. Martin Johnson	H. deH. Bright
Charles T. Schoen	William Burnham
N. B. Trist	C. S. Lewis
<b>Schubert, F.</b>	Harry W. Sheldon
George D. Orr	N. W. Stevenson
F. Schubert	<b>Standard Underground Cable Co.</b>
<b>Security Fare Registry Co.</b>	A. A. Anderson
F. A. Chapman	C. A. Brown
H. C. Donecker	T. E. Hughes
<b>Sherwin-Williams Co., The</b>	H. P. Kimball
H. E. Bellan	W. C. L. Eglin
E. A. Elmquist	

**Standard Varnish Works**

John C. Dolph

L. Robinson

C. W. Upton

E. A. Watrous

**Star Brass Works**

L. Crockett

H. P. Eskelsen

**Stephenson Co., The John**

H. A. Heulings

William H. Heulings, Jr.

E. J. Lawless

S. M. Wilson

**Sterling-Meeker Co.**

C. E. Gierding

R. T. Stowe

G. E. Willis

J. M. Yount

**Sterling Varnish Co.**

C. S. Cool

Arthur Hartwell

George C. Hubbard

Alvin S. King

Dr. Walter Riddle

**Stile Anti-Friction Metal Co.,**

A. C.

Henry W. Toothe

George W. Smith

**Street Railway Bulletin**

John J. Lane

**Street Railway Journal**

W. K. Beard

C. B. Fairchild, Jr.

James H. McGraw

**Street Railway Review**

R. M. Standish

**Symington Co., T. H.**

H. W. Baldwin

J. F. Symington

Carl Tucker

A. H. Weston

**Taylor Iron & Steel Co.**

S. H. Mattson

Knox Taylor

**Taylor Electric Truck Mfg. Co.**

Charles H. Dodge

John Taylor

Walter Taylor

Thomas Thornes

**Tomlinson Coupler Co.**

Samuel C. Dorsey

W. H. McLoney

Charles H. Tomlinson

**Trolley Electric Vehicle Co.**

G. W. Goddard

J. Thomas Landsen

M. Pfatischer

Russell Thayer

**Trolley Supply Co.**

R. K. Fast

E. E. Gilmore

William Huther

J. E. McLain

**Underfeed Stoker Co. of America.**

Charles Bond

C. S. Crowell

F. A. Daley

D. H. Hunter, Jr.

**Underwood Typewriter Co.**

F. R. Coffin

Ralph B. Jacobs

R. Mengert

H. Williams

**United Copper Foundry**

Albert W. Mullen

**United States Engineering Co.**

C. P. Nachod

J. E. Nachod

J. Ernest Nachod

J. F. Nachod

<b>United States Metallic Packing Co.</b>	C. F. Cook Thomas Cooper W. Cooper George B. Dusinberre E. S. Downs H. C. Ebert G. B. Fairbanks John J. Gibson B. H. Glover Leon Goldsmith J. R. Gordon R. P. Jackson J. W. Lucas W. M. McFarland J. C. McQuinston N. J. Neal W. E. Parker S. C. Schenck F. H. Shepard C. F. Street N. W. Storer F. H. Taylor J. E. Webster
<b>U. S. Metal &amp; Supply Co.</b>	
F. Atwater F. C. Dunham B. A. Hageman	
<b>Valentine &amp; Co.</b>	
A. Dowdell A. Phillips Dorning Walker	
<b>Vandorn Co., W. T.</b>	
Guy Hensley W. T. Vandorn	
<b>Warren Webster Co.</b>	
E. K. Lanning W. W. Morgan, Jr.	
<b>Watson-Stillman Co., The</b>	
G. L. Gillon E. A. Johnson Robert Montgomery F. H. Stillman	
<b>Weber Railway Joint Mfg Co.</b>	
James C. Barr Alfred K. Downes James A. Greer K. C. Holloway F. P. Thompson	
<b>Western Electric Co.</b>	
P. H. Coolidge F. C. Jaeger R. H. Harper F. D. Killion	
<b>Westinghouse Elec. and Manufacturing Co.</b>	
E. C. Baugher C. A. Bragg Newcomb Carlton	
	C. F. Cook Thomas Cooper W. Cooper George B. Dusinberre E. S. Downs H. C. Ebert G. B. Fairbanks John J. Gibson B. H. Glover Leon Goldsmith J. R. Gordon R. P. Jackson J. W. Lucas W. M. McFarland J. C. McQuinston N. J. Neal W. E. Parker S. C. Schenck F. H. Shepard C. F. Street N. W. Storer F. H. Taylor J. E. Webster
	<b>Westinghouse Machine Co.</b>
	J. R. Bibbins L. L. Brinsmade L. C. Bullington E. H. Sniffin
	<b>Westinghouse Traction Brake Co.</b>
	G. E. Baker W. S. Bartholomew A. Cameron W. G. Clark H. S. Clark E. H. Dewson C. R. Elicott F. V. Green A. Johnson G. H. Marten F. M. Nellis C. J. Olmstead W. V. Turner

<b>Wharton, Jr. &amp; Co., Inc., Will-</b>	<b>John C. Robinson</b>
<b>iam</b>	<b>Charles W. Savage</b>
Victor Angerer	W. Selfridge
L. R. Ashurst, Jr.	J. W. Stringfellow
Richard W. Bacon	W. Rodman Wharton
J. B. Baker, Jr.	William Wharton, Jr.
T. K. Bell	Rodman Wister
W. T. Burns	William R. Wister
A. R. Cline	<b>Wheel Truing Brake Shoe Co.</b>
W. B. Cooke	J. M. Griffin
A. B. Davenport	<b>White, J. G. &amp; Co.</b>
A. D. Gherky	Fred H. Reed
Edward E. Gilmore	<b>Wood Electric Co., Chas .N.</b>
C. M. Griffith	Robert Mathias
C. S. Karick	Charles F. Wilson
L. Koppenhoefer	Charles N. Wood
R. C. McCloy	<b>Yale &amp; Towne Mfg. Co.</b>
R. C. McLain	C. N. Beaver
John L. Markel	L. P. DeGroot
August Marx	F. J. Ford
J. B. Robinson	A. S. Kille

## DELEGATES

STREET RAILWAY ACCOUNTANTS' ASSOCIATION OF AMERICA

<b>American Railways Co.</b>	<b>Detroit United Railway</b>
J. P. O'Donnell	Irwin Fullerton
Walter W. Perkins	S. W. Mower
Frank J. Pryor, jr.	<b>Elgin, Aurora &amp; Southern Traction Co.</b>
C. L. S. Tingley	Edwin C. Faber
Jos. M. Walsh	J. T. Huntington
<b>Atlantic Shore Line Ry. Co.</b>	<b>Elmira Water, Light &amp; R. R. Co.</b>
F. S. Donnell	H. M. Beardsley
<b>Atlantic Coast Elec. R. R. Co.</b>	<b>Erie Electric Motor Co.</b>
G. B. Cade	Frank G. Given
<b>Birmingham Railway Light &amp; Power Co.</b>	<b>Fitchburg &amp; Leominster St. Ry. Co.</b>
C. M. Corey	Robert N. Wallis
Elmer M. White	<b>Fonda, Johnstown &amp; Gloversville R. R. Co.</b>
<b>Boston Elevated Ry. Co.</b>	E. H. Stichel
Charles S. Sergeant	<b>Fort Wayne &amp; Wabash Valley Traction Co.</b>
Henry L. Wilson	H. E. Vordermark
<b>Boston and Maine R. R.</b>	<b>Indiana Union Traction Co.</b>
F. D. Hall	Isaac McQuilkin
<b>Canton-Akron Railway Co.</b>	<b>Indianapolis &amp; Cinti. Traction Co.</b>
E. B. Kidson	A. A. Anderson
<b>Charleston Cons. Ry., Gas &amp; Electric Co.</b>	G. P. Nicoll
P. J. Balaguer	W. B. Wright
<b>Chicago Union Traction Co.</b>	<b>Knoxville Railway &amp; Light Co.</b>
F. E. Smith	H. T. Bunn
<b>Cleveland Electric Ry. Co.</b>	<b>Lincoln Traction Co.</b>
Henry J. Davies	Charles H. Cox
W. G. McDole	<b>Little Rock Railway &amp; Elec. Co.</b>
Henry Staats	J. A. Trawick
<b>Cleveland and South-Western Traction Co.</b>	<b>Louisville Railway Co.</b>
H. B. Cavanaugh	Samuel G. Boyle
<b>Columbus Railway &amp; Light Co.</b>	
P. V. Burlington	
<b>Connecticut Ry. &amp; Light Co.</b>	
Charles F. Bryant	

<b>Milwaukee Elec. Ry. &amp; Light Co.</b>	<b>Street Railway Journal</b>
H. C. MacKay	Henry W. Blake
<b>Montreal Str. Railway Co.</b>	<b>Tacoma Ry. &amp; Power Co.</b>
Patrick Dubee	J. S. Simpson
T. W. Casey	
H. R. Mallison	<b>Toronto Railway Co.</b>
W. G. Ross	Robert J. Clark
H. R. Shephard	
H. E. Smith	<b>United Railways Co. of St. Louis</b>
<b>Nashville Railway &amp; Light Co.</b>	James Adkins
H. C. Walters	Frank R. Henry
<b>New Orleans Ry. &amp; Light Co.</b>	<b>United Railways &amp; Elec. Co. of Baltimore</b>
H. A. Ferrandou	Norman E. Stubbs
<b>Niagara St. Catharines &amp; Toronto Railway Co.</b>	<b>Union Street Railway Co.</b>
D. J. McIntosh	(New Bedford, Mass.)
<b>Northwestern Elevated Ry. Co.</b>	Elton S. Wilde
R. H. Williams	
<b>Ottawa Electric Railway Co.</b>	<b>Warren, Brookfield &amp; Spencer St. Ry Co.</b>
James D. Fraser	Augustus Nickerson
<b>Penn. &amp; Mahoning Valley Railway Co.</b>	<b>Washington Ry. &amp; Elec. Co.</b>
William T. Burns	William F. Ham
<b>Philadelphia Rapid Transit Co.</b>	<b>Wharton—Wm. J. &amp; Co., Inc.</b>
C. Call	Thomas K. Bell
J. D. Hiestand	
Lansford E. Knapp	<b>Winona Railway &amp; Light Co.</b>
W. J. Kelly	George E. Chaflin
Clarke S. Terhune	<b>Worcester Consolidated St. Ry Co.</b>
<b>Public Service Corporation of N. J.</b>	J. W. Lester
M. R. Boylan	
S. T. Corliss	<b>Bureau of Fire Underwriters</b>
E. A. Desborough	Bruce E. Loomis
William Van Ryper	
P. S. Young	<b>Bureau of Railways—Railway Commission</b>
<b>Portsmouth Electric Railway</b>	W. W. Margaridge
F. P. Fosgate	
<b>Seattle Electric Co.</b>	<b>Bureau of Railway Commrs. State of New York</b>
F. Dabney	H. L. Judson
	<b>Unattached</b>
	Leslie McQuilkin

## DELEGATES

AMERICAN RAILWAY MECHANICAL AND ELECTRICAL  
ASSOCIATION

<b>Baltimore &amp; Ohio R. R.</b>	<b>Electrical Engineer</b>
B. F. Wilhams	J. W. Luker
<b>Beaver Valley Traction Co.</b>	<b>Engineering News</b>
H. H. Lytle	F. E. Schmitt
<b>Birmingham Railway, Light and Power Co.</b>	<b>Electrical Review</b>
W. A. McWhorter	Amslie A. Gray
<b>Boston Elevated Railway Co.</b>	<b>Galena Signal Oil Co.</b>
C. F. Baker	Alfred Green
C. H. Hile	<b>General Electric Co.</b>
John Lindall	Harold W. Clapp
Paul Winsor	<b>Georgia Railway and Electric Co.</b>
<b>Boston &amp; Northern Ry Co.</b>	R. M. Moon
H. E. Farrington	<b>Holmesburg, Tacony &amp; Frank- fort Ry Co.</b>
<b>Brooklyn Heights Ry Co.</b>	James C. Davis
A. B. Metcalf	<b>Holyoke Street Railway Co.</b>
C. F. Sweetland	G. E. Pellessier
<b>Brooklyn Rapid Transit Co.</b>	<b>Hudson Companies</b>
H. L. H. Smith	Hugh Hazelton
<b>Capital Traction Co.</b>	<b>Interborough Rapid Transit Co.</b>
J. H. Hanna	J. S. Doyle
<b>Charlotte Elec. Ry Co.</b>	S. C. Martin
E. D. Latta	F. P. Slater
<b>Cleveland Elec. Ry Co.</b>	H. Wallerstedt
Terence Scullin	<b>International Railway Co.</b>
<b>Cumberland &amp; Westernport Ry. Co.</b>	John Hauf
F. W. Darlington	M. D. Lloyd
<b>Denver City Tramway Co.</b>	John Millar
S. W. Cantril	<b>Lancaster &amp; Southern St. Ry Co.</b>
W. H. McAloney	T. B. Worthington
W. G. Matthews	<b>Lancaster &amp; York Furnace St. Ry Co.</b>
<b>Detroit United Railway</b>	William C. Hahn
S. W. Mower	<b>Louisville Railway Co.</b>
<b>Easton Transit Co.</b>	F. H. Miller
Charles F. Roberts	T. H. Minary

<b>Memphis Street Ry Co.</b>	H. C. Heaton
A. D. McWhorter	Charles Hewett
<b>Milwaukee Elec. Ry &amp; Light</b>	J. Heywood
Co.	Louis T. Klauder
E. W. Olds	George W. Mantz
F. G. Simmons	H. B. Nichols
<b>National Electric Co.</b>	H. H. Nichols
L. M. Sheldon	J. W. Royer
<b>New Jersey &amp; Hudson Ry and</b>	W. T. Schreiber
<b>Ferry Co.</b>	J. W. Silliman
Louis P. Barnheim	Maurice T. Smyser
Henry Donovan	John G. Sonneborn
<b>New Jersey &amp; Penn. Traction</b>	Arthur B. Stitzer
Co.	George B. Taylor
G. C. Killeen	B. Vogel
<b>Newport News &amp; Old Point Ry</b>	C. B. Voynow
& Elec. Co.	
E. L. Holtzclaw	
<b>New York City Railway Co.</b>	
W. Boardman Reed	<b>Philadelphia &amp; Western</b>
<b>North Alabama Traction Co.</b>	J. M. Bramlette
John F. Knowlen	L. N. Downs
<b>Northwestern Elevated R. R.</b>	
Co.	
Robert B. Stearns	<b>Pittsburgh Railway Co.</b>
<b>Philadelphia Rapid Transit Co</b>	J. M. Larned
George J. Allen	
C. C. Anderson	<b>Providence &amp; Danielson Ry Co.</b>
J. H. M. Andrews	J. E. Thielsen
J. Frank Barber	
Gilbert E. Barker	<b>Public Service Corporation of</b>
L. F. Bartlette	<b>N. J.</b>
H. Branson	W. M. Bisil
John B. Breen	John H. Crawford
H. G. Caampion	E. J. Dunne
H. T. Champion	Albert B. Herrick
F. S. Doughty	D. McGregor
J. A. Fernon	J. R. Nelson
W. H. Fess	W. J. Ramsey
Wm. D. Gherky	Charles Remelius
Edward E. Gilmore	J. L. Smyth
Frank Head	Martin White
R. C. Heath	
	<b>Pennslyvania R. R. Co.</b>
	W. E. Swift
	C. T. Nofey
	<b>Phil. &amp; Reading</b>
	C. J. Wickersham
	<b>Rhode Island Co., The</b>
	W. D. Wright

<b>Rochester Railway Co.</b>	<b>United Railways Co. of St. Louis</b>
D. F. Carver.	Laurence P. Crecelius
R. E. Danforth	Merle R. Griffeth
<b>Seranton Railway Co.</b>	M. O'Brien
A. J. Conlon	<b>Utah Light &amp; Railway Co.</b>
William W. May	W. S. Patterson
E. D. Reed	<b>Utica &amp; Mohawk Valley Ry Co.</b>
<b>Seattle Electric Co.</b>	William J. Harvie
W. T. Grambs	<b>Webster Manufacturing Co.</b>
<b>Sioux City Traction Co.</b>	George T. Gwilliam
E. L. Kirk	<b>West Penn. Railways Co.</b>
<b>Southwest Missouri Elec. Ry Co.</b>	J. W. Bridge
E. J. Pratt	<b>Western Electrician</b>
<b>Sterling-Meaker Co.</b>	M. L. Godkin
J. M. Yount	<b>Williamsport Passenger Ry Co.</b>
<b>Street Railway Bulletin</b>	Charles T. Herrick
John J. Lane	<b>Worcester Consolidated St. Ry Co.</b>
<b>Street Railway Bulletin</b>	E. A. Sturgis
H. W. Blake	<b>York County Traction Co.</b>
J. R. Cravath	Fred R. Newman
C. B. Fairchild, jr.	<b>Others Present</b>
<b>Street Railway Review</b>	T. E. Crossman
L. E. Gould	E. G. Daniels
Daniel Royce	Thomas Farmer
J. B. Wenger	Wm. J. Fiss
<b>Syracuse Rapid Transit Co.</b>	S. J. Hall
T. M. Dubois	F. Marchant
<b>Toronto Railway Co.</b>	N. Mutter
H. H. Beasley	L. D. Pellissier
John H. Donnelly	A. W. Pratt
D. McDonald	W. L. Rathman
J. G. Smith	Uni. of Penn.
T. G. Tushingham	H. V. Schreiber
<b>United Railways and Electric Co.</b>	<b>Official Stenographer</b>
H. H. Adams	D. A. Brown
H. A. Leonhauser	

## DELEGATES

## AMERICAN ASSOCIATION OF STREET RAILWAY CLAIM AGENTS

<b>Boston Suburban Elec. Cos.</b>	<b>Philadelphia Rapid Transit Co.</b>
Pitt F. Drew	E. B. Behm
L. B. Kent	Joshua Bell
<b>Chester Traction Co.</b>	Charles Elliott
Joseph H. Cofrode	H. R. Gashorn, jr.
<b>Chicago Union Traction Co.</b>	Mahlon Kline
Henry C. Bradley	John McHugh
<b>Cleveland Electric Co.</b>	W. R. Pope
W. F. Weh	John A. Rhoades
<b>Columbus Railway &amp; Light Co.</b>	S. L. Rhoades
B. B. Davis	Horace Richart
<b>Denver Tramway Co.</b>	H. G. Sixcox
S. C. Dorsey	H. L. Weaver
<b>International Railways Co.</b>	C. K. Willard
Andrew J. Farrell	<b>Public Service Corporation</b>
J Courley Fetter	J. P. Feeney
<b>Interstate Railways Co.</b>	<b>Savannah Electric Co.</b>
E. L. Lindemuth	E. W. O'Connor
<b>Jacksonville Electric Co.</b>	<b>Schuykill Traction Co.</b>
Julius S. Harrison	Isaac Longstreth
<b>Milwaukee Electric Railway &amp; Light Co.</b>	<b>Schenectady Railway Co.</b>
M. S. Rausch	F. A. Brown
<b>Mobile Light &amp; Railway Co.</b>	<b>United Gas Improvement Co.</b>
Benjamin Vincent	J. B. Douglas
<b>New Orleans Railway &amp; Light Co.</b>	<b>United Railway &amp; Electric Co.</b>
W. H. Renaud	James R. Pratt
	<b>Unattached</b>
	W. F. Dorsey

## ENTERTAINMENT.

Among the entertainments provided in the program of the convention was a reception given by the local reception committee, Mr. James F. Rawle, Chairman, in the Ball Room of the Bellevue-Stratford. This reception was from 9 P. M. to 12 P. M. on Tuesday, September 26th, and proved to be a most enjoyable occasion.

On Wednesday, September 27th, the entertainment consisted of a theater party at the New Lyric theater, where the play was John C. Fischers' production of "Babes In The Woods." This occurred at 8 o'clock P. M. and the entire theater was reserved for the occasion.

On Thursday evening the annual banquet of the American Street Railway Association occurred in the ball room of the Bellevue-Stratford at 8 P. M. Approximately 250 people were in attendance and the room was beautifully decorated with flowers for the occasion. A full account of the banquet appears elsewhere in the Report.

On Friday afternoon, a trolley party was given to the ladies through the courtesy of President Roberts of the Fairmount Traction Company. This trolley ride included a trip through Fairmount Park, which is well known for its great beauty.

On Friday evening at 8 P. M. occurred the Vaudeville performance in the ball room. This ball room is provided with a large, well equipped stage for such purposes, and the performers included both amateurs and professionals.

## LOCAL COMMITTEES.

Following is a list of the committees in charge of the arrangements for entertainment:

#### LOCAL RECEPTION COMMITTEE

James Rawle, Chairman	William H. Heulings, Jr.
Maj. Luther S. Bent	Edward Brill
Ed. C. Felton	Charles O. Kruger
B. Dawson Coleman	Fred. Lincoln
William Wharton, Jr.	W. R. Molinard
Richard Ashurst	M. Herman Brill
John B. Parsons	Geo. W. Dickson
John H. Converse	W. Martin Johnson
George D. Widener	Harry S. Hale
G. Martin Brill	Felton Bent
Robert N. Carson	Henry L. Passavant
John A. Rigg	Francis Wm. Rawle
Charles J. Mayer	William M. Lyckett
A. H. Englund	D. S. Coolidge
E. D. Mullen	A. Merritt Taylor
W. M. Budd	W. J. Woolfolk
Ralph Moore	Thomas Newhall
Charles A. Bragg	David Pepper
Thomas Cooper	A. L. Register
Thomas A. Dolan	W. S. Twining
Randall Morgan	E. R. Sponsler
Samuel T. Bodine	Charles Hewitt
Wm. W. Lobdell	Augustus S. Vane
Guilliam Aertsen	Thomas E. Hughes
Samuel M. Curwen	H. F. Martin

## PATRONESSES OF THE RECEPTION

Tuesday Evening, September 26th 9.00 to 12.00 P. M.

AT THE BELLEVUE-STRATFORD HOTEL.

Mrs. John B. Parsons	Mrs. David H. Watts, Jr.
Mrs. James Rawle	Mrs. Charles A. Bragg
Mrs. Geo. D. Widener	Mrs. Wm. M. Lycett
Mrs. G. Martin Brill	Mrs. Walter L. Eustis
Mrs. A. Merritt Taylor	Mrs. Henry L. Passavant
Mrs. Edward Brill	Mrs. Wm. H. Heulings, Jr.
Mrs. Charles O. Kruger	Mrs. H. S. Vane
Mrs. Samuel M. Curwen	Mrs. D. S. Coolidge

## ENTERTAINMENT COMMITTEE

## AMERICAN STREET RAILWAY MANUFACTURERS' ASSOCIATION

C. C. Peirce, Chairman	Wm. Cuntz,
S. W. Trawick,	Pennsylvania Steel Co.
R. E. Moore,	Otis Cutler,
Harry Monroe,	American Brake Shoe &
G. D. Rosenthal,	Foundry Company.
J. C. Galisch,	J. Harry Stedman,
General Electric Co.	Stedman Transfer Co.
H. N. Powers,	John E. Meek,
American Automatic Switch Co.	H. W. Johns-Manville Co., N. Y.
S. I. Wales,	Leroy C. Miller,
National Electric Co.	Manager Street Railway Dept., Galena Oil Co., Franklin, Pa.
W. H. Power,	Karl Andren,
Jos. Cunningham,	Vacuum Oil Company.
National Electric Co.	Samuel A. Megath,
F. B. DeGrass,	Galena Signal Oil Co.
Julien Roe,	W. K. Beard,
Crocker-Wheeler Co.	Street Railway Journal.
W. H. Heulings, Jr.	J. C. Barr,
Samuel M. Curwen,	Webber Rail Joint Co.
J. G. Brill Co.	W. R. Kirschner,
F. A. Esteph,	Columbia Machine Works.
R. D. Nuttall Co.	C. N. Wood,
J. M. Gallagher,	C. N. Wood Co.
R. D. Nuttall Co.	E. W. Kellogg,
Daniel Royce,	Frank Ridlon Co.
Street Railway Review.	W. M. McFarland,
Chas. T. Schoen,	C. S. Powell,
President, Schoen Wheel Co.	J. C. McQuiston,
Chas. K. Knickerbocker,	Westinghouse Electric Co.
Griffin Wheel Co.	F. V. Green,
O. C. Gayley,	Jos. R. Ellicott,
Vice-President, Pressed Steel Car Co., New York.	Westinghouse Traction Brake Co.
Frank A. Barbey,	C. A. Bragg,
Thos. Prosser & Sons.	Westinghouse Electric Co.
C. S. Clark,	
Pennsylvania Steel Co.	

## LADIES AT THE CONVENTION.

Ackley, Mrs. G. S.	Besuden, Mrs.
Adamson, Mrs. Chas. B.	Beyer, Mrs. Henry
Aeby, Miss	Birnwood, Miss
Aeby, Mrs. A. E.	Blackhall, Mrs. J. R.
Alcorn, Mrs. Thos.	Blake, Mrs. H. W.
Alden, Mrs. C. A.	Bloomer, Miss O.
Allen, Mrs. C. L.	Bloss, Mrs. W. H.
Ambos, Mrs. Walter	Bond, Mrs. Chas.
Anderson, Mrs. A. A.	Bonner, Mrs. J. B.
Andrews, Mrs. J. H. M.	Borgner, Mrs. Cyrus
Angerer, Mrs. V.	Borgner, Miss Marie
Apperson, Mrs. R. D.	Bowers, Mrs. Geo.
Apperson, Miss	Boyd, Mrs. P. M.
Armstrong, Mrs. W. A. Jr.	Boyden, Mrs. C. G.
Ashurst, Mrs. L. R., Jr.	Boylan, Mrs. M. R.
Austin, Miss Hazel	Bramlette, Mrs. J. M.
Austin, Mrs. M. M.	Brannon, Mrs. T.
Ayres, Miss	Breen, Mrs. J. B.
Baldwin, Mrs. C. A.	Breen, Mrs. J. P.
Baldwin, Mrs. H. W.	Brewster, Mrs. Wm. D.
Ball, Mrs. Geo. W.	Bright, Miss M.
Ball, Mrs. H. P.	Brill, Mrs. G. M.
Barden, Mrs. G. A.	Brill, Mrs. J. Elwood
Barker, Mrs. G. E.	Bristol, Mrs. H. A.
Barnes, Miss R.	Brower, Mrs. I. B.
Barnet, Mrs. H. M.	Brown, Mrs. Geo. F.
Barter, Mrs. J. Frank	Brown, Mrs. H. N.
Bartholomew, Mrs. W. S.	Brown, Mrs. M. M.
Baumann, Mrs. W. H.	Browning, Mrs. R. R.
Bean, Mrs. Julia Keith	Bryant, Mrs. C. F.
Beard, Mrs. W. K.	Buehler, Mrs. J. G.
Beardsley, Mrs. H. M.	Buckley, Mrs. A. C.
Beaver, Mrs. C. W.	Buggy, Mrs. J.
Beetem, Mrs. J. R.	Bunting, Mrs.
Beggs, Mary Grace	Burdinger, Miss
Belknap, Mrs. R. E.	Burns, Emily F.
Bell, Mrs.	Burns, Mrs. W. J.
Bell, Mrs. Wm. S.	Burton, Mrs. Carroll
Bellman, Mrs. H. J.	Butler, Mrs. W. W. S.
Belser, Mrs. J. H., Jr.	Butterfield, Miss C.
Bennett, Miss Clara	Butterfield, Miss M.
Berroth, Mrs. H. W.	

Carr, Mrs. R. F.  
Carson, Mrs. R. N.  
Cary, Mrs. T. C.  
Casèy, Mrs. T. W.  
Chamberlain, Mrs. E. G.  
Clark, Mrs. C. H.  
Clark, Mrs. C. S.  
Clarke, Mrs. Wm.  
Clayton, Mrs. W.  
Clayton, Mrs. W. G.  
Cline, Mrs. A. R.  
Clitz, Mrs. R.  
Coakley, Mrs.  
Coane, Mrs. W. J.  
Coates, Mrs. C. B.  
Conklin, Mrs. F.  
Conklin, Miss L.  
Connelly, Mrs. F. D.  
Cook, Mrs. E. J.  
Cooke, Mrs. W. B.  
Coolidge, Mrs. D.  
Coolidge, Mrs. P. H.  
Cooper, Miss H.  
Cooper, Miss M.  
Cooper, Mrs. Thomas  
Connette, Mrs. E. G.  
Corrigan, Mrs. C. E.  
Cosper, Mrs. W. P.  
Courtney, Mrs. W. J.  
Craig, Miss A.  
Crane, Mrs. S. S.  
Crook, Mrs. R. W.  
Crossman, Mrs. T. E.  
Crowell, Miss  
Crowell, Mrs. C. S.  
Crowley, Mrs. H. J.  
Cummings, Miss Ann  
Cummings, Miss E.  
Cunningham, Mrs. J. T.  
Currie, Mrs. Chas.  
Curtiss, Mrs. Elliott  
Curwen, Mrs. S. M.  
Dailey, Mrs. S. H.  
Daly, Mrs. Joseph F.  
Daner, Mrs. Geo.  
Danforth, Mrs. R. C.  
Danforth, Mrs. R. E.  
Darling, Mrs.  
Darlington, Mrs. F. W.  
Daughtry, Mrs. J. E.  
Davies, Mrs. H. J.  
Davies, Mrs. John T.  
Davis, Miss A.  
Davis, Mrs. E.  
Davis, Mrs. James K.  
Day, Mrs. Chas.  
Deemer, Mrs. F. P.  
DeGroot, Mrs. L. P.  
Delano, Mrs. N.  
Dengler, Miss  
Denton, Mrs. J. H.  
Dickel, Mrs. C. A.  
Dickson, Mrs. D. J.  
Dobson, Miss  
Dossert, Mrs. J. J.  
Dowdell, Miss  
Drake, Mrs. F. A.  
Drake, Mrs. F. J.  
Dressel, Mrs. C. H.  
Dressel, Mrs. F. W.  
Dressel, Mrs. H. J.  
Driffield, Miss  
Duble, Mrs. C.  
Duclos, Mrs. L. O.  
Duemler, Mrs. D. F.  
Duffy, Mrs. J. E.  
Dunlap, Mrs. Alvin  
Duntley, Mrs. J. W.  
Duntley, Mrs. W. O.  
Duty, Mrs. A. E.  
Eastz, Mrs. C. B.  
Eckhart, Miss  
Edgar, Mrs. H. T.  
Edgin, Mrs. Geo. A.  
Edgar, Katharine

Edmund, Mrs. F. W.  
Edwards, Mrs. J. A.  
Eggert, Mrs. C. A.  
Eisenbrey, Mrs. R. H.  
Ellis, Miss  
Elwell, Mrs. R. T.  
Ely, Mrs. W. Caryl  
Englund, Mrs. A. H.  
Ernshaw, Mrs. Edward  
Eskelsen, Mrs. H. P.  
Estabrook, Mrs. G. L.  
Esterbrook, Mrs. Mary  
Evans, Mrs. H. C.  
Fagan, Miss Jeannette  
Fairchild, Mrs. C. B., jr.  
Farrand, Mrs.  
Fast, Mrs. R. K.  
Faust, Mrs. Geo. F.  
Felton, Mrs. E. C.  
Fernon, Mrs. J. A.  
Ferrandou, Mrs. H. A.  
Fichthorn, Mrs. Luke  
Flanagan, Mrs. C. W.  
Fleming, Mrs. R. G.  
Flynn, Mrs. F. I.  
Fodish, Miss E.  
Ford, Mrs. F. J.  
Forster, Mrs. W. D.  
Foster, Mrs. J. A.  
Freund, Miss E. M.  
Frost, Mrs. D. C.  
Fry, Mrs. N. L.  
Frye, Mrs. H. B., Jr.  
Fryling, Mrs. G. P.  
Fuller, Mrs. F. L.  
Fullerton, Mrs. Irwin  
Fulton, Mrs. Chas. B.  
Gallagher, Mrs. J. M.  
Garton, Mrs. W. R.  
Geiger, Mrs. Wm.  
George, Mrs. C. N.  
Gerdon, Mrs. F. J.  
Gherky, Mrs. William D.  
Gilmore, Mrs. E. E.  
Girber, Miss  
Goble, Mrs. W. H.  
Goddard, Mrs. G. W.  
Godkin, Miss  
Godkin, Miss G. L.  
Godkin, Mrs. M. L.  
Goldsborough, Mrs. W. E.  
Goodall, Miss  
Gould, Mrs. L. E.  
Gowing, Mrs. J. P.  
Grady, Mrs. James  
Graham, Mrs. Edward S.  
Graham, Mrs. John R.  
Graves, Ella G.  
Green, Mrs. H. B.  
Green, Mrs. E. C.  
Greenburg, Mrs. A. G.  
Greenwood Mrs. Geo.  
Griffin, Mrs. J. M.  
Griffith, Mrs. C. M.  
Haas, Mrs. Fred  
Hague, Mrs. C. E.  
Hale, Miss B.  
Hall, Mrs. E. C.  
Ham, Mrs. Wm. F.  
Hamilton, Mrs. R. B.  
Hamlin, Mrs. E. M.  
Hammond, Mrs. Mary A.  
Hankey, Mrs. Anthony  
Hanna, Mrs. J. H.  
Harahan, Mrs. T. J.  
Harmon, Mrs. C. E.  
Harper, Mrs. R. H.  
Harrison, Mrs. J. S.  
Haskell, Mrs. Geo. M.  
Hastings, Mrs. Geo. S.  
Hawkins, Mrs. Thomas  
Hayes, Mrs. Jerry  
Hayes, Miss  
Hayes, Mrs. John  
Hayllar, Mrs. Benj., Jr.

Hayllar, Miss H.  
Hedrick, Miss Alma  
Hedrick, Miss Ida  
Hegarty, Mrs. D. A.  
Hegarty, Miss Margaret  
Hench, Mrs. N. M.  
Hequembourg, Mrs. K. D.  
Hering, Mrs. W. E.  
Herrick, Mary  
Heulings, Mrs. H. A.  
Heulings, Mrs. Wm. H., Jr.  
Hewett, Mrs. F. A.  
Heywood, Mrs. Jas.  
Hibbs, Mrs. J. R.  
Hibbs, Miss  
Hinmon, Mrs. W. E.  
Hippee, Mrs. G. B.  
Hoadley, Mrs. George  
Hoeger, Mrs. Geo.  
Hoff, Mrs. Sam'l S.  
Holland, Mrs. Jas. L.  
Hopkins, Mrs. M. S.  
Hormann, Mrs. F. W.  
Horney, Mrs. C. E.  
Howell, Miss G.  
Hoyt, Mrs. D.  
Hudders, Mrs. E. J.  
Hunter, Mrs. D. H., Jr.  
Hurd, Mrs. G. A.  
Hurley, Mrs. P. E.  
Huther, Mrs. Wm.  
Ingersoll, Mrs. J. B.  
Jack, Mrs. A. G.  
Jaeger, Mrs. F. C.  
Jameson, Miss Helen  
Jarden, Mrs. C. P.  
Jarvis, Mrs. M. R.  
Johnson, Mrs.  
Johnson, Miss  
Johnson, Mrs. C. W.  
Johnson, Mrs. Chas.  
Johnson, Mrs. E. A.  
Jones, Mrs. J. C.  
Jones, Mrs. R. V.  
Jordan, Miss K. K.  
Judson, Mrs. A. L.  
Kane, Mrs. L. J.  
Keeler, Mrs. H. E.  
Keeran, Mrs.  
Keller, Mrs. Julius  
Kellogg, Mrs. Henry  
Kelly, Mrs. John  
Kelly, Mrs. T. F.  
Kenfield, Mrs. H. J.  
Kenfield, Miss  
Kennedy, Mrs. F. B.  
Kerr, Mrs. G. M.  
Kerschner, Mrs. W. R.  
Keyes, Mrs. F. A.  
Kibbe, Mrs. A. S.  
Kibbe, Miss Helen  
Kidson, Mrs. E. B.  
Kille, Mrs. A. S.  
Killion, Mrs. F. D.  
King, Mrs. C. K.  
Kingston, Mrs. W. W.  
Kinney, Mrs. E. M.  
Kirk, Mrs. E. L.  
Kitt, Mrs. F. T.  
Kleinschmidt, Mrs. H. F. A.  
Klock, Mrs. G. M.  
Knapp, Mrs. A. C.  
Knisely, Mrs. A. G.  
Knowlton, Mrs. S.  
Koehler, Mrs. Robt.  
Koppenhoefer, Mrs. L.  
Kruger, Mrs. Chas.  
Krusen, Miss V. D.  
Kuhn, Mrs. H. J.  
Kuhn, Miss Mabel  
Lampkin, Miss Eva  
Lane, Miss D.  
Lane, Mrs. N. P.  
Langworthy, Mrs. E. L.  
Lawler, Mrs. T. J.  
Lawrence, Mrs. E. V.

Lawrence, Mrs. H. H.  
Lawrence, Mrs. V. O.  
Leatherman, Mrs. A. E.  
Leidenger, Mrs. J.  
Leonhardt, Mrs. J. H.  
Lex, Mrs. F. A.  
Liddell, Mrs. R. B.  
Light, Mrs. S. P.  
Lincoln, Mrs. F. H.  
Lindall, Mrs.  
Lippincott, Mrs. Nathan  
Littlefield, Mrs. A. S.  
Livsey, Mrs. J. H.  
Lloyd, Mrs. M. D.  
Lockett, Miss Belle  
Long, Mrs. C. C.  
Lovejoy, Miss Alma  
Lowd, Mrs. Mark  
Lucas, Mrs. J. W.  
Lundgren, Miss  
Lupton, Mrs. D. D.  
Lupton, Mrs. E. L.  
Lycett, Mrs. W. M.  
Lycett, Mrs. Wm. M., Jr.  
Lynch, Miss H. G.  
Lyon, Mrs. O. A.  
McAleer, Miss Helen R.  
McCloy, Mrs. R. C.  
McDale, Mrs. W. G.  
McDonald, Mrs. M. J.  
McEowen, Mrs. F. D.  
McGilvray, Mrs. J. L.  
McGlynn, Mrs. W. P.  
McGough, Mrs. S. P.  
McGraw, Mrs. J. H.  
McIlvain, Mrs. Wm. R.  
McKinney, Miss A.  
McKinnon, Mrs. A. J.  
McLain, Mrs. J. E.  
McMichael, Mrs. J. G.  
McSorley, Miss Anna  
McSorley, Mrs. John  
McVicker, Mrs. W. B.  
MacAfee, Miss C. H.  
MacAfee, Miss I. B.  
MacAfee, Miss C. I.  
MacAfee, Kathryn  
Mack, Mrs. H. L.  
Mackay, Mrs. H. C.  
Macomber, Mrs. Geo. E.  
Maize, Mrs. W. L.  
Maloney, Mrs. F. G.  
Markham, Mrs.  
Marks, Miss  
Marsh, Mrs. H. C.  
Martin, Mrs. H. F.  
Mason, Mrs. E. R.  
Mathias, Mrs. Robt.  
Mattson, Ethel  
Mayer, Mrs. C. J.  
Mead, Mrs. G. A.  
Meixell, Mrs. A. E.  
Mellor, Mrs. L. B.  
Merrick, Mrs. Hartley  
Merrill, Mrs. S. H.  
Miller, Mrs. F. D.  
Miller, Mrs. Le Roy G.  
Muller, Miss H.  
Millen, Mrs. T.  
Miller, Mrs. W. W.  
Miller, Mrs. C. V.  
Mirk, Miss  
Mitchell, Mrs. P. J.  
Moody, Mrs.  
Mitchell, Mrs. W. E.  
Moore, Miss  
Moore, Mrs. A. J.  
Moore, Mrs. Percival  
Morgan, Mrs. W. W., Jr.  
Morgan, Miss  
Morris, Mrs. E. P.  
Mulholland, Mrs. W. J.  
Murphy, Mrs. John  
Musser, Mrs. F. B.  
Mylander, Miss Florence  
Nachod, Mrs. J. E.

Nachod, Mrs. J. F.  
Nagle, Mrs. G. O.  
Naxis, Mrs. Wm. A.  
Newcomb, Mrs. F. H.  
Nicholl, Mrs. H. A.  
Nichols, Ellen S.  
Nichols, Mrs. H. B.  
Nickerson, Mrs. Augustus  
O'Brien, Mrs. M.  
Ogden, Mrs. J. W.  
Ogden, Lillian M.  
Oliver, Mrs. R. G.  
Olds, Mrs. E. W.  
Olmstead, Mrs. C. J.  
Oppenheimer, E. Mildred  
Orr, Mrs. Geo. D.  
Orr, Mrs. D.  
Osborne, Mrs. M. P.  
Page, Mrs. H. C.  
Page, Miss  
Passailaigue, Mrs. T. W.  
Patterson, Mrs. G. S.  
Patterson, Mrs. J. W.  
Pearson, Mrs. Alfred  
Pearson, Mrs. Paul P.  
Peck, Mrs. E. F.  
Penington, Mrs. T. C.  
Perkins, Mrs. Walter W.  
Perry, Mrs. J. W.  
Peters, Mrs. Rich'd  
Pevear, Mrs. T. F.  
Phillips, Mrs. A. L.  
Phillips, Mrs. J. W.  
Pollock, Mrs.  
Pope, Mrs. J. F.  
Pope, Mrs. W. C.  
Porter, Mrs. Chas. E.  
Potter, Mrs. E. E.  
Power, Mrs. W. W.  
Pratt, Mrs. E. J.  
Pratt, Mrs. M. D.  
Price, Mrs. H.  
Radcliffe, Mrs. G. L.  
Ransom, Mrs. H. M.  
Rawle, Mrs. James  
Rea, Mrs. C. S.  
Reed, Mrs. F. H.  
Reed, Mrs. Frederic H.  
Reed, Mrs. W. B.  
Reichard, Mrs. C. H.  
Remelius, Mrs. C.  
Remelius, Mrs. Chas.  
Rennick, Mrs. Alex.  
Ridings, Miss B.  
Ridings, Miss W.  
Rigg, Mrs. John A.  
Rigg, Mrs. Sam'l B.  
Rigg, Mrs. Walter A.  
Rihl, Mrs. H. H.  
Robinson, Mrs. Henry A.  
Robinson, Mrs. J. C.  
Rogers, Miss  
Root, Mrs. F. N.  
Ross, Mrs. E. N.  
Ross, Mrs. W. G.  
Rothwell, Mrs.  
Ruegenberg, Miss  
Russell, Miss Alice  
Russell, Mrs. S., Jr.  
Rutherford, Mrs. E. C.  
Sanville, Miss  
Satterly, Mrs.  
Satterly, Mrs.  
Satterthwait, Mrs. J. G.  
Saxton, Miss  
Schleiner, Miss  
Schmucker, Mrs. N. J.  
Schofield, Miss L.  
Schubert, Mrs. F.  
Scott, Mrs. Charles  
Siedel, Miss  
Selfridge, Mrs. Wm  
Severin, Mrs. F. C.  
Shaw, Mrs. E. P.  
Shaw, Miss  
Sheppard, Mrs. R. K.

Shipper, Mrs. I. D.  
Shurtz, Mrs. J. R.  
Siebert, Mrs. W. P.  
Simmons, Mrs. F. G..  
Simmons, Mrs. F. G.  
Simmons, Mrs. F. H.  
Sloan, Mrs.  
Smith, Mrs. Chas. H.  
Smith, Mrs. E. J.  
Smith, Miss Florence  
Smith, Mrs. G.  
Smith, Mrs. G. M.  
Smith, Miss Helen King  
Smith, Mrs. John  
Smith, Mrs. L.  
Smith, Miss Mary  
**Smith, Miss**  
Smith, Mrs. W. H.  
Smyth, Mrs. M. C.  
Smythe, Miss N.  
Smythe, Miss K.  
Snow, Miss A. F.  
Snow, Mrs. H. A.  
Snyder, Mrs. C. M.  
Sommers, Miss H.  
Sooy, Miss  
Spear, Mrs. G. W.  
Speer, Mrs. J. S.  
Speyer, Miss  
Sprague, Mrs. C. E.  
Standish, Mrs. R. M.  
Stare, Mrs. B. R.  
Staub, Mrs. W. H.  
Sterling, Mrs. Augusta  
Stevens, Mrs. F. J.  
Stewart, Mrs. A. L.  
Stickel, Mrs. E. H.  
Stiff, Mrs. H. C.  
Stone, Mrs. B. W.  
Sturdevant, Mrs. C. R.  
Sturgis, Mrs. E. A.  
Summers, Mrs. H. W.  
Swain, Miss  
Swallow, Mrs. S. H.  
Swartz, Mrs. B. F.  
Tanberg, Mrs. G. E.  
Tanburg, Miss  
Taylor, Mrs. A. M.  
Taylor, Mrs. F.  
Taylor, Mrs. George B.  
Taylor, Mrs. Wm. S.  
Tenney, Mrs. F.  
Thomas, Mrs. E. P.  
Thomas, Mrs. W. H.  
Thompson, Miss  
Thorn, Mrs. J. W.  
Thornley, Mrs. F. C.  
Tillinghast, Mrs. A. W.  
Tingley, Mrs. C. L. S.  
Tonicon, Edna  
Toothe, Mrs. Henry W.  
Towle, Mrs. J. M.  
Tracy, Miss Mary A.  
Tripp, Mrs. B. H.  
Turlay, Mrs. W. W.  
Twining, Mrs. W. S.  
Tyson, Mrs. F. A.  
Vandewater, Mrs. H.  
Van Horn, Mrs. Geo. W.  
Vetterlein, Miss M.  
Voorhis, Mrs. H. M.  
Voynow, Mrs. C. B.  
Vreeland, Mrs. H. H.  
Wade, Mrs. P. M.  
Wakeman, Mrs. J. M.  
Walker, Mrs. Dorning  
Walker, Miss E. L.  
Walker, Mrs. Ed.  
Walsh, Miss Inez  
Walters, Mrs. H. C.  
Wampler, Miss  
Warp, Mrs. L.  
Warner, Mrs. E. O.  
Warren, Mrs. C. C.  
Warren, Miss E.  
Watkins, Mrs. J. W.

Watson, Mrs. Geo.	Wilson, Mrs. Jno. A.
Wattles, Mrs. J. F.	Wilson, Miss Kathleen
Weis, Mrs. Wm.	Wilson, Miss Mary
Wells, Mrs. G. F.	Wilson, Mrs. S. M.
West, Mrs. C. H.	Wister, Mrs. Rodman
Wethercut, Mrs. E. S.	Woltman, Mrs. J.
Wharton, Mrs. W. Rodman	Wood, Mrs. Chas. N.
Whipple, Mrs. A. L.	Wood, Mrs. Walter
Wilcox, Mrs. C. H.	Woodman, Mrs. F.
Wilkinson, Mrs. E. F.	Wright, Mrs. Thos. A.
Wills, Mrs. G. S.	Yardley, Mrs. J. H.
Wilmot, Miss	
Wilson, Mrs. J. R.	Yates, Mrs. M. deF.

### THE BANQUET.

The banquet held in connection with the Philadelphia convention was probably the most successful of any ever given under the auspices of the Association. It took place in the Grand Ball Room of the Bellevue-Stratford Hotel, which was especially arranged and beautifully decorated for the occasion. The dinner and service were in the Bellevue-Stratford best style.

A touch of appropriate sentiment was happily secured by including on the state at one end of the ball room, partly screened amid banks of palms, a perfectly constructed model of a New York Broadway car, as built by the John Stephenson Company, and loaned for the occasion by the J. G. Brill Company.

The tables were beautifully decorated with flowers, and souvenirs in the form of miniature trolley cars were provided for the occasion. The menu card was cleverly designed to represent the great conquest of Franklin in the field of electrical science and the modern application of electricity to the traction industry. The design included an artistic representation of a figure of Franklin, acting as a medium for diverting the electric current from the clouds to a modern interurban car.

At the conclusion of the banquet the guests were entertained by the several speakers who responded to the toasts.

## MENU

	TID BITS, "BEN FRANKLIN"	
BARSEC	CAPE COD OYSTERS	CELERY
AMONTILLADO SHERRY	POTTAGE GOURMET A LA ROYALE	
	HORS D'OEUVRE'S VARIES	
SEA BASS SAUTE BELLEVUE	POMMES DE TERRE PARISIENNES	
MOET ET CHANDON	BRUT IMPERIAL	
MIGNON OF BEEF HONGROISE	STUFFED TOMATOES	
CIGARETTES	SORBET TRANSIT	
PHILADELPHIA SQUAB	ESCAROLE SALAD	
PLOMBIERES DUMAS	CROQUANTS	
CIGARS	CAMEMBERT AND ROQUEFORT	COFFEE

## TOASTS

*"Some are Weather-Wise, Some Otherwise."*

—Franklin Poor Richard

Franklin's Day and Ours.....HON. JOHN WEAVER  
*"Join We Together for the Public Good."*

The Association.....W. CARYL ELY  
*"The Dignity and the Height of Honor."*

Our Canadian Brethren....GEORGE TATE BLACKSTOCK, K. C.  
*"Our Country is the World—Our Countrymen  
 are all Mankind."*

Corporations and the Commonwealth..THOMAS N. McCARTER  
*"Men in Great Places Are Thrice Servants."*

Street Railway Management.....JOHN I. BEGGS  
*"That Man is Great Who Can Use the Brains of  
 Others to Carry on his Work."*

The Trolley.....GEN. EUGENE GRIFFIN  
*"Sing Who Will of Orpheus' Lyre  
 Ours the Wonder-working Wire."*

The Ladies.....JAMES RAWLE  
*"Woman is the Sunday of Man's Life."*

Toastmaster.....JOHN B. PARSONS  
*"O! For a Forty-Parson Power!"*

## THE SPEECHES.

After the service of the menu President Ely called the Company to order and said:

Members of the American Street and Interurban Railway Association (applause)—such I believe is our name—Ladies and Gentlemen:

This beautiful dinner brings to a close in a most fitting manner the 24th Annual Convention of the American Street Railway Association. Not for sixteen years have we before had the pleasure of having with us Mr. John B. Parsons, the President of the Philadelphia Rapid Transit Company. (Applause.) Long have we waited in vain for Parsons to come to us, and finding him not we have come to Parsons. I am going to testify your own and my appreciation of the pleasure we enjoy in having him with us by turning over to him the subsequent proceedings of this function. I take great pleasure in introducing to you Mr. John B. Parsons. (Applause.)

Mr. John B. Parsons, acting as Toastmaster.

Mr. President, Ladies, Guests and Members of the American Street Railway Association of the past, with the addition of the Interurban Railway made today. It is not my purpose to indulge in any extended remarks this evening. There are others here who are ready, willing and anxious to be heard, and I do not wish to deprive them of that pleasure. (Laughter.)

This occasion brings to my mind many memories of the past. It is true, as stated by your President, that I have not been very regular in my attendance upon the meetings of the American Street Railway Association, and, Mr. President, I want here and now to take occasion to congratulate you on the great success that has attended your 24th Annual Meeting which has been just held in this city (applause), and I want to add a word of commendation for the Manufacturers' Association which has given such a beautiful and extensive exhibition of the various things which enter into the transportation problem as applied to electric street railroads. They deserve much credit and I am personally gratified at the manner and the extent of their exhibit.

Following a trite expression that you have often heard on the street "things are different now," the only thing that recalls to my mind the days of the past vividly is the little car on the stage. In the early days of the meetings of these various associations, electricity was talked about incidentally, but apparently electric traction was a thing far off in the future. There was in

existence at that time another system besides the horse car system, aptly described by the Chinaman in these words,

"No pushee, no pullee  
Go like h—all the samee."

We had our own troubles then as now. We were charged with many things that we were not guilty of then as now. There was no need for denying them then as now, because we would not be believed. (Laughter.) They charged us with overworking and under-feeding our horses. That was a base slander. They charged us with putting in the cars for the purpose of keeping the feet of the passengers warm, salt hay that had been previously used for bedding the horses. That was also a slander. The only mistake was that we did use it first in the cars, for the purpose of warming the feet of the passengers and afterwards used it in the stables.

Seriously speaking, the great evolution that has taken place in the transportation problem as applied to large communities and small communities alike, has been very great in the last fifteen years, especially in the last ten years. I feel like one of the remaining parts of a choice brand of old vintage. There are a few remaining in the Association who were in it at the time of my first connection with it. We had prominent men at that time who discussed the various methods of transportation as applied to horse cars, such as the quantity of hay and corn to be fed to the horses, the delicate habits of the Louisville mules (laughter), and I notice that while these subjects were not discussed at your meetings recently, there are other subjects equally as vital, equally as important, not only to the community that you serve, but to the interests of those who have invested in your companies.

I think probably I will have to keep my promise that I did not intend to take your time and deprive others of the opportunity to say what they have to say, and I will turn to the serious side of my subject. No doubt many of you who are strangers in the City of Philadelphia, have heard and read many unkind things of this city. Some may be true, others the natives do not believe (applause), but aside from that part of it you must all agree with me that you have had a week of beautiful weather, what you would designate as good weather. This is not the only good thing that we have in the City of Philadelphia, Ladies and Gentlemen, and I will leave it to his Honor, the Mayor, to tell you of a few other good things we have here.

Now I have the pleasure of introducing the Hon. John Weaver, Mayor of the City of Philadelphia. (Applause.)

TOAST—Franklin's Day and Ours.

“Join we together for the Public Good.”

Responded to by the Hon. John Weaver, Mayor of the City of Philadelphia.

Mr. Weaver: Mr. Toastmaster, Ladies and Members of the American Street and Interurban Railway Association (Is that right?): I hope you don't think from the Toastmaster's introduction that “weather” is all that Philadelphia can produce. I must congratulate you on the weather you have had during your stay in this city, but even Philadelphia did not furnish that. I sent to Washington for it. (Applause.) I got into communication with the man at the head of the Weather Bureau, the man who never lies, and I arranged that there should be a week of very good weather, unless we should get a West Indian hurricane about Friday or Saturday. I have sent down to Florida and asked them to corral the hurricane, if they can, and hold it back until the sessions of the American Street Railway are over. The weather man in Washington informed me the other day that the good weather had been sent to Philadelphia, not because the American Street Railway Association was meeting here, but because the ladies were meeting here also, because the delegates and other gentlemen who were attending the Convention had brought with them the ladies, (applause), so you see that the ladies are responsible for the fine weather you have had during your session.

A Voice: God bless the ladies.

Mr. Weaver: So say we all of us, God bless the ladies; and is it not strange that an American man should desire to go to so many stag dinners after witnessing the inspiration furnished to the occasion by the presence of the ladies at a dinner like this? I should think that the American Street and Interurban Railway Association, after to-night would vote that they would never again have a dinner unless the ladies were present. (Applause).

I see by referring to the program, that on the menu card there is a trolley pole with the word “slow,” and on the other side of the menu card where the toasts are arranged there is another trolley pole, with the word “fast” on it. I asked what was the meaning of this and was informed that those who responded to the toasts were expected to get through quickly. I notice that Mr. Parsons had not read it before he got up, but I have read

it and I do not propose to take very much of your time. In looking at the toast list, I see that I am expected to respond to the toast "Franklin's Day and Ours." It seems a far cry back to the time of Franklin. One hundred and thirty years and we are back in the hey day of his life in this City of Philadelphia. One hundred and thirty years! What a short space of time if we look at the history of Nations, and yet how long it seems to us. We look at the City of Philadelphia of that day with its few miles of streets on the front, on the River Delaware front, and all of the fine houses in that vicinity, and you can imagine that if you got as far back as Tenth Street you were out in the country. But today we see what great development, what great progress has been made, and in looking at the cover of the menu card we see that Franklin has been transposed into a trolley to run from Philadelphia to San Francisco. I might tell you a secret,—Mr. Parsons suggested to me, not many months ago, that we should take the hat off William Penn, who stands 550 feet above the street, on top of our City Hall tower, and put a kite in his hand, to make him look like Franklin, and during thunder storms have a wire attached to the statue and bring the lightning down and transfuse it into the trolley wires, so that Mr. Parsons could use the current in running his cars. How much we owe to Franklin. If he could come back today and see the results of his labors, he would be greatly gratified, for it seems to me when we go to the field of electricity that we go back to the time he did harness the lightning in drawing it from the clouds. We see the wonderful progress made in this beautiful city of ours, as well as in every city, because the progress of this city is only typical of the progress of the world. I can truthfully say that during the past fifteen years the interests which you represent have had a great deal to do with the development and progress of this country, and I can say I think, without being much of a prophet, that in the next thirty years you will have more to do with the progress of this country than any other body of men in the country. (Applause.)

I am glad to know you have had a very successful Convention. I am told that there are a number of new inventions on exhibition at your Meeting Hall; in fact, I am informed that Mr. Parsons has already adopted one that gives additional holding straps for standing room, (Laughter and applause), and, I am also informed that he inquired around of everybody to see if there was not some kind of a car that has standing room on top of it, but which was so arranged that the passengers could not

come in contact with the trolley wire and thus avoid damage suits being brought against the Company for being electrocuted.

Joking aside, I was rather interested in one little thing that occurred, and it was a little discussion that my friend Mr. Ely had on "Municipal Ownership." I do not know whether I dare speak on the subject of Municipal Ownership to this company at this time, but I recognize the fact that I am speaking to American citizens, and they are broad-minded and liberal enough to listen to any discussion that concerns them or the country. I have never given my views on Municipal Ownership—and I am not going to give them tonight; but I am going to throw out, with your permission, one or two suggestions before I sit down. One is that Municipal Ownership of Street Railways will never be agitated, or agitated successfully, in any community where that community feels that the Street Railway Company in that particular locality is doing all that it reasonably can for the welfare and benefit of the people in that community. (Great applause).

The only other suggestion I am going to make, and I am sure you will acquit me of having given you my views on Municipal Ownership when I am through the two—is this: I have heard a great deal said about the fact that Municipalities could not run their Street Railways. I assume when that statement is made everybody who makes it has in his mind that politics will enter into the control and operation of Street Railways by the Municipality. I entirely agree with that statement, if politics is to control the operation of the Street Railways, but let me say this to you—if politics could be eliminated then I see no reason why any Municipality could not run its Street Railways as effectively and as economically as private corporations. Whether politics can be eliminated is another question.

I have given you these thoughts, gentlemen, take them home and think over them. I am sure you will acquit me of having given you my views on Municipal Ownership. I am grateful to the members of this Association and to the officers who have brought this Convention here. You have honored Philadelphia in coming here. Last Monday morning I extended to you, symbolically, the keys of the city. I thought that everything was running smoothly, but I heard that a lady had gotten into trouble. She had gone out in the park in an automobile and was stopped by one of the park guards who was doing his duty. Being a law abiding citizen, instead of calling me up she applied to the proper

Department and got her license. I regret the incident, but I will say here and now, that a park guard is no respecter of persons; he would stop me as soon as he would stop her, they even arrested the chauffeur of one of the Park Commissioners the other day. So I hope that she will forget the park guard and the unpleasant incident, and think only of the pleasant things which have occurred in Philadelphia; and I hope that you will go away from this city with some very pleasant recollections of her. (Applause.)

A voice: What is the matter with Mayor Weaver?

Many voices: He's all right.

TOAST—The Association,

“The Dignity and the Height of Honor.”

Responded to by Hon. W. Caryl Ely.

The Toastmaster: Ladies and Gentlemen: I am about to call on a gentleman to respond to a toast, who without exception is the greatest diplomat I have ever come in contact with in the securing of an office. I am told, and I believe, that it has been an unbroken rule in this Association from its inception up to two years ago, never to elect the same man as its presiding officer for more than one year. For some reason that I know nothing about, so far as the second year is concerned, the rule has been broken, but I do know that if the same tactics were employed in his second election as were employed in his third election, the explanation is simple. I now have the pleasure of introducing the culprit himself, the Hon. W. Caryl Ely, of Buffalo, N. Y.

Mr. Ely: Mr. Toastmaster, notwithstanding the invidious distinction that you have just drawn against me I cherish no hard feelings toward you. It is true that last year I was for the second time honored with an election to the Presidency of the American Street Railway Association; today I have been elected the First President of the American Street and Interurban Railway Association. (Laughter and applause.) Notwithstanding your appreciation of the point, I dare not leave it there, because I am afraid my friend on the left will arise and say that all that would be necessary to assuage my somewhat easy conscience if I sought the office again next year would be to again change the name of the Association. (Applause.)

I was much pleased with the remarks of Mayor Weaver, and with the interpretation he drew from the picture on the first page of the menu. He seemed to think it was Franklin drawing lightning from the clouds for the purpose of propelling a trolley car

from New York to San Francisco. I, however, am aware that we are in Philadelphia, and it seems to me perhaps we might draw the inference that Benjamin was on top of the car for the purpose of keeping the lid on. (Great applause.) And that his face was raised to heaven where, perchance, he saw the Mayor in the clouds to whom he beseechingly addressed the inquiry—Mr. Mayor, am I standing hard enough? Do my efforts please you? (Laughter.) I may say in behalf of a party of Street Railway men who came from Chicago last Sunday night and went through Philadelphia to New York to come back Monday morning to attend the Convention, because they understood the lid was on in Philadelphia, that if the subject of that beseeching inquiry, is whether or not the lid is on tight enough, they say—Amen, it is. (Applause.)

It is a fact that the Mayor in addressing the first meeting of the Mechanical Association on Monday morning, generously and graciously handed over to that Association the keys of the city. I remarked at that time, not facetiously, but earnestly, hoping that my statement might result in something favorable to this Association during its stay in town, that it was understood by us from the outside that the key did not unlock as much as it used to. The Mayor, however, stated that it unlocked the hearts of all Philadelphians to this Association, and judging by the manner we have been received and entertained in this city, surely his remark was true. We have been taken to the hearts of the people of Philadelphia and have had a most delightful and enjoyable time. (Great applause.)

The subject that has been assigned to me, I note, is "The Association," the words "The Association" meant yesterday The American Street Railway Association, and today these words mean the new Association, or the newly named Association, of which I have spoken. Perhaps you don't know much concerning the Association. You may be in the same position that a ward politician, of whom I have heard, was toward the political organization in the county in which he lived. The political leader in that county, who was setting in operation the caucuses that were to result in the fall conventions, was talking to a lot of countrymen very earnestly about the merits of the organization and the duty that was involved on all good citizens of supporting the organization. He called it organization. Pat said that he was with the organization, and after the conversation was over it was absolutely apparent that it was a true statement on his part and he

was with it. They were about leaving when Pat said to the leader—George, what the devil is this organization anyhow? (Laughter.) This organization of ours I am sure, you need no description of. It is the official association of those who are connected with the electric railways, the Street and Interurban Railways of the United States. We have had our meetings here, the proceedings of each one of the sessions having been reported very fully in your very able press. We have had a very splendid exposition, because such it may be termed, of the things that enter into the prosecution of the business. This display was given in the Philadelphia Museum by the generosity of the Manufacturers' Association, of which your honored citizen, William Wharton, Jr., is a member, and toward the success of which he has labored so long and so earnestly. (Applause.) That exposition speaks to you more forcibly than any words I could address to you of the magnitude of the interests that are represented here. It is only a short time ago, as remarked to you by Mr. Parsons, when the questions that agitated the minds of Street Railway men in their conventions were the ways to bed horses and proper kind of hay and oats with which to feed them. Today the questions that come before the Street and Interurban Association are those which involve corporations and companies in which are invested more than three billions of dollars of capital, and that are conducting transportation interests that involve hundreds of millions of annual passengers over the different lines. I might say to you that if you desired to differentiate the Street Railway or the Electrical Railway business of today from that of the past, you might go up to the Exposition Building and look at one of the magnificent cars there exhibited and then compare it with the one which I hold in my hand. (Mr. Ely exhibited a small tin street car which was distributed at the banquet as a souvenir of the occasion.) It would be pretty nearly a fair comparison.

I would say, digressing for a moment, if the cars which are exhibited here tonight are fair samples of the Philadelphia Transit Company's accommodations, they surely do not belong to Philadelphia, because the lid is on. (Laughter.)

I cannot say much about our Association without exposing myself to the charge being brought against me by some subsequent speaker that, inasmuch as I have occupied the Chair as Presiding Officer at your Convention for more than one term (which has brought upon me, evidently, the displeasure of the

Toastmaster), I am seeking to laud my personal honors and official position and to exploit our products and ourselves; but I do wish to say only one or two words seriously concerning the matter.

I don't want to discuss Municipal Ownership with His honor, the Mayor, in his own bailiwick; but I do wish to say that today there is but one thought that is agitating the minds of those who are engaged in the Street and Interurban business, and that thought is to bring the business to the highest state, to give service and accommodations that shall meet the wants of the people, and shall cause the people to feel that those who are entrusted with the transportation interests, which are represented by this organization feel that they have a trust to discharge and are determined to do it in a proper manner. I quite agree with the statement of His Honor, Mayor Weaver, that if public transportation by Street and Interurban Railways shall be so well done as to leave no want that is felt by the people there would not be heard in this country the question honestly agitated of the Municipal Ownership of these facilities. I said the other day to a gentleman who is here, when we were conversing on this subject, that if the question ever comes to a head in this country, if it ever gets to a place where it amounts to anything that is anything, you will find that the place where the people will first take over a Street Railway property is the place where the service is the poorest and the place where they will last take over the Street Railway property will be the place where it is the best.

There are several questions that affect us which we are today powerless to settle. Those who have the charge and management of those properties today, must accept and take the conditions as they find them, and unless they have brought about these conditions they must be held to be absolutely innocent of anything in connection with them that may be unjust or wrong. There is one question that is of vital importance and that lies at the root, I think, of all the agitation. That is the question of capitalization, and concerning the question of over capitalization, I think it may be honestly, truthfully and successfully asserted that almost all the people of this country who have participated in this business must share in the faults and the situations that confront us all. The country is enormous in its extent, enormous in its population, enormous in its accumulative wealth. While the countries of Europe have had centuries and centuries in

which to get to their present state, everything here has been evolved in a few years. The people in this country have been turned loose, without let or hindrance, or restraint, almost, and we have all, all of the people of the country, been deeply absorbed in the problems with which we have been confronted. Enormous systems of steam railways have been constructed, some of them embracing within their systems more miles of railroad than there are in some of the entire countries of Europe. Enormous systems of street railroad transportation have grown up, and upon some of these individual systems more than a million of passengers are transported daily.

Now, I say that it is up to all of us, all honest, God-fearing, law abiding American citizens, to work together; to work out the problems that confront us, and to work them out in such a way without wrong to any one and without harm to any one, that the highest degree of perfection may be attained. (Great applause.)

I sincerely believe that as the light is let in upon all these vexed questions and problems, and as the people of this country give them their best thought and study, you will find that by and by out of all the seething, boiling mass which we seem to be to the eyes of Europe, will be evolved that which is right, that which is proper, and the property of no man will be destroyed in this country. Confiscatory measures will never prevail in this country. I do not believe that the property of corporations is in danger, but I do believe the managers of corporations are becoming imbued with the idea that they are invested with trusts which they should honorably and fairly discharge to their fellow citizens, and when they work at the trust with which they are charged in the manner in which they are now setting themselves to do, I believe that the people of the country will be satisfied and all interests will be conserved. (Applause.)

I hope and believe that this Association in its broader and higher plane of work will be a potent influence in the settlement of these questions.

I thank you for your attention; and I now wish to say that when my friend, my respected friend, the Mayor, for whom I have formed in a very few days a warm friendship and a feeling of the highest respect and admiration, when the Mayor speaks of the possibility of this Association so far forgetting a common duty as to leave the ladies out of our annual dinner, he little knows us; he misjudges us. We might go wrong on our car

mileage; we might go wrong on stocks and bonds, but Mr. Mayor, we are in contact always with the body of the people, with the men, and the women and the children. We take them into our cars, we transport them safely, and their mothers, their sisters, and their wives we always bring to our banquets and dinners.

I want to thank the Mayor again, in closing, for the portion of the key of the city which I have held. So far as I am concerned, it has unlocked and opened everything that I cared to see. If there is anything that is concealed beneath the lid, I am quite sure that no member of this Association has pried the lid to try to open it up. (Applause.) I will say to the Mayor, for you and for myself, that I trust that every success may attend his efforts in keeping the lid down. (Applause.)

Voces: Three cheers for our President, now and forever!

TOAST—Our Canadian Brethren.

“Our Country is the World—Our Countrymen  
are all Mankind.”

Responded to by Mr. George Tate Blackstock, K. C., of Toronto, Canada.

The Toastmaster: There is one portion of a corporation, so far as the management of a railroad company is concerned that is not much in the public eye. It is a necessary adjunct so far as the corporation is concerned, though it does not appear before the public in a general way. We are extremely fortunate this evening in having with us a guest from a sister nation. How he ever got beyond New York I am unable to explain. I think I can say with you with perfect truth that it has never occurred before. Certainly not within my knowledge, nor within the knowledge of those I have talked with, and I know of no reason why he did get beyond New York except by the persuasive influence of the gentleman who brought him on here for an ulterior purpose. I desire to state, as I said before, that while Mr. Ely may hide behind the subterfuge of a new Association, the statement that I made is absolutely true. This gentleman is better known in New York than he is in Philadelphia. He is better known in Canada than he is in New York.

I now have the pleasure of introducing to you, Mr. George Tate Blackstock.

Mr. Blackstock: Mr. Chairman, Ladies and Gentlemen,—My first duty in rising to address you tonight is to thank you, Sir, for your congratulations upon my having escaped the seduc-

tions of New York and arrived safely in Philadelphia; and you, Ladies and Gentlemen, for the very kind and gracious manner in which you have been pleased to receive this toast.

I need scarcely say, Sir, that it is a very great pleasure for a backwoodsman like myself to come down into one of the greatest centers of the continent and find myself in touch with those great captains and leaders of American industry, whose courage, whose tenacity of purpose, whose vigor of will and whose resourceful capacities for conception and construction have made the American name renowned throughout the world, and whose lives and characters exhibit so much that is worthy of emulation; and in particular, Sir, I am very glad indeed to find myself among the members of this Association who are concerned in the exploitation and management of those great enterprises which not only serve the comfort and convenience of urban communities upon this continent, but are in addition, as I am persuaded, intimately connected with the moral and physical well-being of those communities, and are, as Mayor Weaver has so well said, an important factor in our modern civilization.

Well, Sir, having said so much I should be very well pleased to resume my seat without saying more unless, indeed, I intimated the pleasure with which I find, through the preceding speakers, that there are the same very interesting internecine pleasantries and strifes in this country and in my own, between the bond-holder, the stock-holder and the strap-holder. (Laughter.) It is exceedingly pleasant, Sir, to feel that these are not the exclusive possession of my country; but that they also manifest themselves in yours.

Mr. Chairman, when you spoke of your unwillingness to deprive the orators on the list below you of the pleasure of speaking let me assure you that that remark passed me without touching me in the slightest. I felt it had not the smallest application to me. There was, I believe, a precept of general acceptance amongst the ancient Schools of Rhetoric, which prescribed for the orator the rule that in his opening sentences he should very intimately consult the predilections of his audience and be careful that he said nothing that would in any way grate upon their feelings or set them against him. I am sorry to say that I have to begin tonight by contravening that very salutary rule and by admitting that I find myself in very grave difficulties. In the first place my friend, Mr. Ely, has demolished for me that great fortress of unctious mediocrity which consists in being

able to truthfully say one is unexpectedly called upon. That was a cruel thrust from a friend. How often have I retired behind the friendly ramparts of that asylum of saved oratorical reputations, leaving behind me the pleasant impression that if I had only had timely notice I could have produced a composition worthy of the occasion! But by advertising the call he intended to make on me with orderly and merciless precision, the President of your Association has robbed me of that pretext. But, Sir, my difficulties are of a far deeper and more radical kind. I am to speak to you tonight of the Canadians, a people who have modestly squatted down upon one-fifteenth of the land surface of the globe, a country a little larger than the United States itself; and it must be obvious to the most obtuse person that if the length of my speech is to bear any relation to the geography of my country—(Loud Laughter.) Ah! yes, Ladies and Gentlemen, I see that with quick American intelligence you take me. (Applause.) I like to address an audience that arrives before the sentence does. Well, in addition to that, Sir, our international relations have become so numerous and complex and their ramifications so extended that it is a little difficult to know what topics to touch upon and what to pass by. Then again, there is the question of whether in addressing you I shall speak with frankness and candor, that frankness and candor which we of the English-speaking tongue always admire, and without which there can be no real comprehension between us, or whether I shall merely mount the trapeze and with post-prandial agility execute some of what you would call rhetorical "stunts." (Great applause and laughter.) Well, Sir, happening to meet a friend of mine as I was quitting home, in whose judgment I greatly confide, I represented to him those difficulties of mine. "What is the occasion of your speech" he demanded. I told him that it was a banquet of gentlemen interested in street railways. "Oh," said he, "That is very simple indeed. Your choice lies between the sound advice which I shall give you and those oratorical imbecilities which you will prepare in the train going down." "Now," said he, "my advice to you is to simply get up and tell the audience that we have a splendid Street Railway System in Toronto and sit down again, and you will be voted a great success." (Loud Laughter.) Well, Sir, I am sorry to observe that about this board the advice of my friend seems to meet with a somewhat more sympathetic response than I could have hoped for. That makes me hasten to say that like all persons who seek

advice I have not the slightest intention of being governed by it. I will not, Mr. Chairman, use that old sporting expression and say that I am "loaded for bear" nor shall I so far accommodate myself to my present environment as to say that I am "charged for the grade" but I will borrow a simile suggested by a very active and intelligent little instrument I saw in a public place today and say that you cannot drop a nickel into my slot without producing the gum candy of my eloquence. (Laughter and applause.) You have brought this down on yourselves and I have not the slightest intention of coming down here and appearing at this banquet without getting off my speech. I intended, Sir, to devote this morning, feeling the weighty responsibility that devolved upon me, to the preparation of a proper speech; but early in the day I fell in with two charming ladies, the wives of High Moguls in this Association, who represented to me that if I would accompany them on their automobilious career during the day they would save me harmless in respect to your wrath and indignation at the feebleness of my remarks this evening, and they assured me if the worst came to the worst and the audience was indignant that at all events I might be certain that I should stand well with them, however I stood with the audience (Applause.) So it does not in the least matter what you think of my speech; you may pour down upon me the vials of your wrath; you may beat the tom-toms of your indignation; you may transfix me with the darts of your satire; you may put me in the pillory of your everlasting contempt; but you cannot and you shall not deprive me of the high standing which I have achieved during the day with those ladies. They are here tonight and I observe that they are keeping a menacing optic upon you and woe betide the man who fails to applaud my sonorous cadences or omits to laugh when an alleged joke heaves in sight. (Laughter.)

Those ladies took me out into Fairmount Park and suggested that we might concoct a speech out there and that I might try to imagine that one of those delightful hillsides covered with trees was an audience and deliver the speech to them. We did so. It was a speech which I thought most admirable and which I intended to reproduce here tonight, but unfortunately I find myself in the same situation as that Clerk in Holy Orders of whom Disraeli speaks in his *Curiosities of Literature*. The gentleman was extremely nervous and represented to his Bishop that he feared he should never be able to stand in the pulpit and acquit

himself with credit. The Bishop recommended him to go out in the kitchen garden and endeavor to imagine that the rows of cabbages were his audience and to practice upon them. He did so and became a very effective Cabbage Garden Orator, but upon his venturing into the pulpit to try it there he found that the that this audience is not a row of trees and that it is a question old **rigor mortis** seized him and he was unable to say anything for a long time, but at last he blurted out "Ah! Christian Brothers and Sisters, at length I perceive that you are not cabbage heads." (Laughter.) Well, I am gradually perceiving, Mr. Chairman, whether my speech would go even if I could recollect it.

Mr. Chairman, Ladies and Gentlemen, it is not a very great wonder, perhaps, that the country from which I hail should receive some consideration at your hands. Not only is that country your great neighbor to the North with a contiguous boundary line of nearly four thousand miles, but our social commercial and political relations are becoming more numerous, more complex and more extensive from day to day.

Sir, we are standing upon historic ground tonight in the history of this great Republic. I need not enlarge upon the great Republic. I need not enlarge upon the great and conspicuous role which this city has played in your history, but what I wish to bring to your notice tonight is that in a certain qualified sense this city may be said to be the birthplace of the great Dominion of Canada to the North. These twin giants of the American Continent lay here in their infant days, 130 years ago, in the same cradle. They issued from the same spot. It was in 1759 that Wolfe broke forever the power of France on this continent in the great struggle with Montcalm on the Plains of Abraham. That was only seventeen years before the revolution of the American colonies and one would have expected that these French Canadians, conquered but yesterday as it were, would have been among the first to have joined in that great revolution. How came it that instead of doing so they stood aside and had no part in it, but on the contrary remained faithful to Britain? Well, Sir, the reason is to be found in the first place in the liberal and generous treatment which Great Britain meted out to them after the conquest. If you look at the treaty of Paris, signed in 1763, in which the terms of capitulation were deposited, you will find that Great Britain treated these people, in sharp contrast perhaps to her treatment of the American Colonies, with the greatest generosity and liberality. Their language, their

religion, their laws and many of their national rights and privileges were secured to them. Following upon this, in 1774, these French Canadian rights and privileges were crystalized in what is known as the Quebec Act, an Act of the Imperial Parliament by which their rights were secured and that Act has ever since been regarded as the charter of French Canadian liberties. Well, now it happened that in the same year, 1774, there met here in Philadelphia the first national convention of the American colonies to formulate their grievances and to protest against the tyrannies and exactions of the Crown; and in the Declaration of Rights, which was then drawn up it is a curious fact that while declaiming and rightfully protesting against the encroachments of the Crown and its arbitrary proceedings, yet oddly enough by one of the strangest contrarieties in history they also protested against that large measure of liberty which the Mother Country was granting to their fellow-colonists in Canada. The language of the Declaration of Rights in which this protest is couched is so notable that I could not forbear today to extract it in order that I might read it to you as it seems to me one of the most important items in the history of this continent. In that Declaration the liberal action of England toward the French Canadians is stigmatized as one which "recognized the Catholic Religion, abolished the equitable jurisdiction of England and ignoring the antagonistic faith of the old colonists, their laws and government, set up civil and spiritual tyranny in Canada to the great danger of the neighboring Provinces which have so much aided Britain to conquer our country. Nor can we suppress our astonishment that a British Parliament should ever consent to establish in that colony a religion that often drenched your Island in blood and disseminated impiety, bigotry, persecution, murder and rebellion throughout every part of the world." Well, Sir, that Declaration played a conspicuous part in subsequent events upon this continent. The French Canadians were frightened by its terms and felt that their rights and liberties as secured by the Treaty of Paris and the Quebec Act were safer in the keeping ~~as~~ under the Mother Country than they would be in the hands of the American Colonies, and so, when, two years later, the revolt of the colonies took place, Canada stood aloof from that great movement. That was the commencement of Canadian nationality, and it was created in the best center in which we are gathered tonight. So much, then, for the creation of a French Canada

hostile to the new Republic. But there was then no English Canada. How came it that there sprung up alongside of French Canada an English Canada also hostile to the United States? Well, for that circumstance we have also to thank you. As you created a French Canada, British in sentiment, so also you placed alongside of it an English-speaking Canada, British in its predilections too. Immediately after the close of the Revolutionary War your forefathers expelled from the United States great numbers of those who during the war had remained loyal in their attachment to the Crown and there then took place one of the greatest **treks**, to use the South African term, in history. There were expelled from this country from twenty-five to forty thousand people, honorably known in the history of the United Empire as loyalists, who went out into the forests of Canada, carrying with them feelings of burning indignation against those who had expelled them from their homes, not only because of the confiscation of their property but because of the personal indignities to which they had been subjected. These people were no rabble but great blocks of human granite, and your forefathers by their action in expelling them laid them deep and firm into the masonry foundation of the Dominion of Canada. And when, later on in 1812, when the Mother Country's hands were tied in her titanic struggle with Napoleon and you declared war once more against her, it was these people and their descendants who, acting with the French Canadians at Detroit, at Fort Erie, at Lundy's Lane, at Crysler's Farm, at Queenstown Heights, at Niagara, at Grimsby, at Kingston, at Chateauguay and on the ramparts of Quebec, gave so gallant an account of themselves, turned back your invading forces and at the end of three years of strenuous war were able to hand over the great country of Canada once more inviolate and intact to the Mother Country. (Loud applause.) Sir, That war and the incidents connected with it solidified Canadian national sentiment, both French and English, toward the Mother Country.

After this there followed a long period of peace upon this Continent. During that time you were extending the boundaries of the Republic and opening up vast areas to the purpose of mankind; so also in the North the Canadians, in their quiet, unobtrusive and more modest way, were developing Canada. The Republic grew rapidly; Canada grew slowly. After a time there sprang up in this country that opinion, not dead yet, which felt that Canada could be coerced into the Union by being divorced

from the trade of this country. I well remember when I was a youngster one of the most distinguished men that this country has had in modern times telling me that we in the North must either be content to be perpetually divorced from the trade of the continent or we must come into the American Union. I ventured then to tell him what history has since shown to be true, that the same spirit of sturdy resistance which characterized the people of the United States characterized their brethren to the North and that they were little likely to be coerced by considerations of this kind. But these opinions prevailed in the United States and for years a hostile tariff was maintained in this country against Canadian products. After various efforts to modify this condition of affairs the Reciprocity Treaty of 1856 was negotiated between Mr. Marcy on your side and Lord Elgin on ours, and during the next ten years the trade between the two countries advanced by leaps and bounds greatly to the advantage of both. Notwithstanding this, those who held to the opinion that Canada could be forced into the Union by trade ostracism were so far able to control matters that at the termination of the ten years during which the Reciprocity Treaty was to run they secured its abrogation instead of its renewal. This created a very unfavorable impression in Canada as it was regarded as an intimation upon the part of the United States that they did not desire to trade with us unless we joined them politically. Now at the time of the abrogation of the Reciprocity Treaty there was no Dominion of Canada. It was a group of scattered provinces, each independent of the other, and it was largely as a result of your action in refusing to renew the Reciprocity Treaty that Canadian statesmen felt that unless the British North American Provinces were consolidated and fused into a great confederacy it was doubtful whether they could maintain themselves upon the continent in opposition to the United States. And so a spirit of cementing unity sprang up between the various provinces, which, two years later, on the 1st of July, 1867, issued in the Confederation of the British North American Provinces and so, largely as the result of your action in these United States, there was set adrift upon the stream of time that great political entity, known as the "Dominion of Canada" stretching from where the East Atlantic billows spend their fury against the rock-bound coasts of the Maritime Provinces to where on the West the Pacific tells its tale of summer gladness to the beach, and from the International Divide on the South to

where the Dog Star with brightest ray peers into the frozen bosom of the North, and over the whole of this vast territory, dedicated like your own great country to the genius of liberty, there is not a man who, while he wishes to cultivate terms of amity and friendship with you, is not still at the same time animated with the sentiment of maintaining the independence and integrity of his country, and the honor of its flag.

Well, Sir, even after the Dominion was created grave fears were entertained of its future and there were not wanting faint hearts who feared it would never survive its infancy, but again you came to our rescue by a series of unfriendly acts which roused in Canada sentiments of national indignation, as, for instance, when, although you were forcing England on the one hand to pay you damage for the Alabama claims, you at the same time declined to pay us damage resulting from the Fenian incursions into our country. Then came your tardy and reluctant payment of the Halifax Award; your failure to ratify the Atlantic Fisheries Treaty although that convention was signed by your own plenipotentiaries; your steady refusal to negotiate a trade treaty; then came the passage of the McKinley bill which cut off a large and lucrative trade between Canada and the United States; and this, in turn, was followed by your claim that the Behring Sea was *mare clausum*—mere mill-pond of the United States—from which you claimed to exclude us, and your high-handed proceeding in seizing our vessels and taking them into American ports. All these and many other unfriendly acts upon your part sank deep into the minds and imaginations of our people and created a profound impression upon them and there arose, together with a sturdy sentiment of resentment and resistance, a profound conviction amongst our people that you were actuated by feelings of animosity towards us; that no fair international bargain was to be made with you but that your only idea of fair dealing was that you should get everything and give nothing. And so, Sir, it is this great Republic which has, in a large measure contributed to create a national sentiment throughout the Dominion and to consolidate and unify the national feeling. (Applause.)

Well, Sir, we have received these hard knocks at your hands as I have told you. My father used to be very fond of telling how, years ago, in the contest between General Grant and Mr. Greely, he found himself out in Indiana and a Republican orator was telling an audience of the iniquities of the Democratic party

and of the fatal instinct they had for always getting on the wrong side of every question, and after he had pointed out how successfully they had done so in the past he demonstrated how they were doing it on the present occasion, on the great question of "greenbacks." "However," said he, "Fellow-Citizens, let them go on. It is only by blundering and making mistakes and getting hard knocks in consequence of their mistakes that they will ever learn anything. They remind me of an old farmer up in my neighborhood whose son had a bull-pup and he was anxious to make the pup cross and savage and so to that end he clipped his ears and docked his tail. This brought some temper to the surface but not as much as he wished for and so he pulled the dog about and teased him. At last his father said one day, 'Well, my boy, how are you getting along with the pup?' The boy answered 'Oh! First-rate, father. Get down on all fours and make a lunge at him.' The old man did so and the pup also lunged and grabbed the old man by the nose and held on firmly to the delight of the urchin who cried out, 'Hang on, Father, hang on. I know it hurts but it will be the makins of the purp.' " (Laughter and applause.)

Well, Mr. Chairman, you have been the making of the Canadian pup. You have brought out his spirit and so it comes to pass that we have cleaved to the Mother Country and that our development, unlike your own, has been in association with her. One of the most remarkable and thoughtful deliverances I have met with in recent years emanated from one of your distinguished men, Mr. Andrew D. White, in a speech delivered in Washington a few years since, entitled "Evolution versus Revolution," in which he threw out the idea that perhaps all the grievances under which the American colonists labored might have yielded to constitutional agitation, and that perhaps, after all, it would have been better if the development of the United States had taken place in association with the Mother Country instead of the rebellion. Well, opinions differ about that. I am one of those who believe that it has been an immense advantage to the world that the American colonists broke away from their allegiance to Great Britain and have had an independent development of their own. (Applause.) On the other hand, Sir, ours has been in association with the Mother Country and I sometimes wonder why these great minds which are engaged in your industrial enterprises do not think it worth while occasionally to examine the experiment in human government which is taking place in the country to the North

of them. It is an interesting experiment and one which lies midway between the extremes of the Old World and the New. If you observe the Canadian people you will find that they are in all respects a compromise between the English and the American. It is not surprising that this should be so for we have been a small and comparatively insignificant portion of the Anglo-Saxon family sandwiched in between two large and powerful sections of it, the United States to the South, and Great Britain across the water. We have been powerfully played upon by both. On the one hand our juxtaposition to you, the circumstances that, like you, we were exploiting in a new country, that our surroundings were more closely analogous to yours than those of the Mother Country, the exigencies of pioneer life in a new country, all these things made us borrow largely from you and hence it is that in many departments of legislation, customs, manners and forms of life we are more like you than like the Mother Country. On the other hand, we have continued to have social, political and commercial connections with the Mother Country and have gained immensely by bringing into the new Dominion many of the customs, manners and forms of life of the older civilization of the Motherland. Hence it is that our development has been slower than yours. It has, perhaps, to some extent been more conservative and while we have lost something of the energy and rapidity of growth and development which you have known yet, on the other hand, I think we have gained something; I think, perhaps, the sentiment of reverence has been slightly more accentuated amongst us than with you; I think, perhaps, respect for law and order has been a little more marked and that the political boss and the revolver have not been quite as much in evidence as they would have been under other circumstances. In these respects I think we have gained. We have, perhaps, been greater borrowers and more frequently guilty of grand and petit larceny than any other community in the world. We have pilfered more ideas than any other community I know of. We have borrowed, I need scarcely say, tremendously from you. We have done the same thing from the Mother Country. The application of the stolen goods to the circumstances of our own country and the welding them into our national life have been exclusively our own work.

Our comparative insignificance has had another result; It has compelled us to look outside of ourselves and I think I may claim for my countrymen that they are less insular and self-

regarding in their views than either you on the one hand or the inhabitants of the Mother Country on the other. We have been accustomed to contemplate and study you both and hence it is that today we are always able to translate the Englishman and the American to one another more successfully than they are able to interpret themselves to one another. I am one of those old-fashioned people who still believe that Providence takes a hand in the affairs of this world and I believe that when the wrench came by which you separated from Great Britain, Providence left that great country to the North of you in the possession of the British Crown in order that it might be the common ground where the United States and England should meet once more in the future and renew their bonds of affection and interest. I do not mean by that political union, perhaps, but a union of sympathy and sentiment and it is curious to note in this regard that the *rapprochement*, that good feeling which now exists between Great Britain and the United States, largely results from those acute controversies which have sprung up between them in respect to the Dominion of Canada and which, yielding to peaceful solution and happy compromise, have terminated in the end in a far more friendly feeling between those who participated in those disputes than existed before. In further illustration of this idea it may be pointed out that those bold and aggressive spirits whom you furnish in such large numbers are entering into our country and are there finding renewed fields for activity, opportunities for fame and fortune which, in some instances, have been denied them at home. I need only point to such brilliant examples as Sir Wm. Van Horne, Mr. Chas. M. Hayes and Sir Thos. Shaughnessy, all of whom are citizens of this country who have risen to the highest position of influence and honor in the Dominion of Canada, as well as having found immense fields for the useful employment of their great talents (Great applause). So that in this respect we are also now feeling the good effects of the relation of which I have spoken.

Mr. Chairman, Ladies and Gentlemen, I fear I have detained you at far too great length. It is one of the misfortunes of an extempore speech that one is betrayed into situations of that kind, but before I sit down tonight I wish to say that I have not brought forward these differences which have existed between us in the past for the purpose of reviving ancient grievances and animosities. That would not only be in very bad taste, but a gross breach of your generous hospitality. My object is quite

the reverse. These differences between us have been merely quarrels of the nursery, which serve in after years to draw together more closely those who participated in them. My object tonight is to persuade you that our lots have been cast upon this great continent and that our futures, as our pasts, are indissolubly bound up together. That little band of people to the North of you are the third best customers you have in the world today. Last year we purchased from you one hundred and fifty million dollars' worth of goods. Hostile tariffs, Sir, cannot entirely interrupt friendly intercourse and friendly barter between peoples of generous sentiments lying on both sides of the international line.

Well, Sir, to borrow a beautiful expression from your country, we are "up against" many of the same propositions in Canada that you are. I think that is one of the most forcible expressions you have ever put into circulation. (Laughter).

Sir, I am not interested in the question of what changes are to take place upon the face of this continent. "Man proposes and God disposes," as the old copy-book headline said. I know how futile are these speculations. No one, 150 years ago, would have believed that France and Spain would have disappeared, bag and baggage, from this continent as they have in the interval. Therefore it is not germane to my object tonight to indulge in forecasts of what political alterations are likely to happen upon the face of this continent and it is of no consequence, Mr. Chairman, because there are far deeper things that ought to be occupying our minds and engrossing our energies. The question which it is important for both of us to ask ourselves is what real contribution are we making to civilization and the advancement of the world and what is the real character of our vaunted progress? In vain you send up your tall chimneys, in vain you speed the wheels of industry, in vain you construct your vast railway and steamship services, in vain you build your private palaces and public institutions, in vain are the avenues of transportation choked with the prolific products of the field and mine and factory, in vain you amass wealth beyond the dream of Midas,

"Or where the gorgeous East with richest hand  
Showers on her Kings  
Barbaric pearls and gold——"

All, all, all is in vain unless the individual man, the unit, in the body politic, is marching up the hill of moral as well as material progress. The question we have to decide in common with you

is whether, in this great scene of unparalleled prosperity which we occupy on both sides of the line, we are going to render ourselves examples of Goldsmith's line which says,

"And Honour sinks where Commerce long prevails."

or whether we are going to use this immense prosperity by responding to the responsibility which it entails upon us and producing a civilization correspondent to the opportunities which we have and of a kind which is likely to challenge the admiration of mankind. (Loud applause). And, Sir, if I were able to persuade myself tonight that I was the bearer of any mission amongst you who are here, my trumpet call would summon you, not to competition with us in war, nor yet alone in commerce, nor yet alone in the peaceful arts and sciences, not in these alone but in the effort to induce mankind to scale higher and higher from one plane of moral elevation to another until we have arrived at such a pitch of progress and perfection as the world has never seen before; that the world has a right to expect from us and we shall conspicuously fail amidst all these opportunities and successes of ours unless we demonstrate as well to the world that we are capable of a moral elevation and dignity which are compatible with them. (Loud applause.) It is to this competition that I would invite you tonight; to exertion upon this ennobling structure and I cannot do better in closing than quote to you in support of this idea the magnificent language of your own immortal Webster "Nomen praeclarum et venerabile," speaking at the funeral of that other distinguished American, Mr. Justice Storey, when, speaking of the Temple of Justice, he said, "Whoever labors on this edifice with usefulness and distinction; whoever clears its foundations, strengthens its pillars, adorns its entablatures, or contributes to raise its august dome still higher in the skies, unites himself in name and fame and character with all that is and must be durable as the frame of human society itself." (Long and continued applause).

TOAST—Corporations and the Commonwealth.

"Men In Great Places Are Thrice Servants."

Responded to by Hon. Thomas N. McCarter, of New Jersey.

The Toastmaster: We have with us tonight a gentleman as a guest who has met all conditions in street railway operation. It is not common, to my knowledge, that a lawyer is a good nickel-gatherer, so far as the lawyer is concerned, but when he combines the calling of a Street Railway President with that

of a lawyer, he may achieve success. I have now the pleasure of introducing to you the Hon. Thomas N. McCarter, President of the Public Service Corporation of New Jersey.

Mr. McCarter: Mr. Toastmaster, Mr. President, Mr. Mayor (who has gone), Ladies and Gentlemen: It is a nice task that is assigned to me just now. It is twelve o'clock, too late for the Mayor, and I am called upon to speak on "Corporations and the Commonwealth." I feel as I did some years ago when I went to my first political convention to nominate a man for an obscure office. My turn came when the delegates at the convention were tired. I was not tired. I was full of vim, and I went to the stage and started out with all the enthusiasm I had, when a delegate at the end of the hall said, "I move that the young man be given leave to print."

At best, the subject of corporations and the commonwealth does not seem to me to be a good digestive cordial after a good dinner. During the pending insurance investigation in New York, the Vice-President of one of the large companies, a very prominent man of affairs, commenced his testimony by giving to the committee, and through them to the public, the story of his life. I have no desire to emulate his example, but I do not mind saying to this company that I began going to school when I was eight years old and from that time to this my campaign of education in various spheres of professional, political and business life has gone merrily on, but in the last two years-and-a-half, during which time I have been in the public utility business, I have learned more than I did in all the rest of my time put together. Some of the wisdom that I have imbibed has not been without its humorous side. For example, I have learned how the street railway operating men of one community regard the talents of those in other communities. I was in Milwaukee this summer, and met Brother Beggs and said to him, "Who are the good street railroad men in this country?" "Well," said he, "there are not many." I asked him to name some. He said, "Well, if there is one outside of Milwaukee, it is John Parsons of Philadelphia." (Laughter.)

Now, Mr. Mayor (who has gone), these are stirring times. Seriously, it is twelve o'clock at night, and I do not want to tire you with any serious thoughts. I have given you my introduction, and am willing to pass on to the conclusion and cut the rest out, but if you want to hear a few serious thoughts I will give them to you.

(Voices—Go on; go on.)

Mr. McCarter: These, are indeed stirring times. Corporations are not very popular just now, especially quasi-public corporations. The public mind is inflamed, and we must admit that there is some justification. Without this great corporate development we have had, undoubtedly there would have been no such progress as we have made. Notwithstanding, as these corporations grow up, assaults upon them seem to increase, in my judgment almost always unfairly. The real truth of the matter is this, and we might as well be frank, that the pioneers in this industry—by the way, this thought has been expressed very largely by Mr. Ely, who I regret to say, must have seen a copy of my speech, which I had already given to the newspapers, as he has gotten off a great deal of it—the real truth of the matter is this, that the pioneers in this street railway business were not content with a moderate and justifiable profit, great as the work they did was, but they heaped upon these companies a burden of over-capitalization, under which many of them are now struggling, and the knowledge of which inflames the public mind, notwithstanding the fact that those men who caused it have passed from the scene of action, and other men who are not chargeable with their faults have come into possession of the properties. Verily, the sins of the fathers are visited on the children, even unto the third and fourth generation. The public should remember in connection with this, that, if these securities had not been issued in bygone days, the progress of today would not have been so great, certainly not to any such extent as we witness it at the present time. Moreover, those securities were issued under the forms of law, and are entitled to the equal protection of the law, and any legislation, that by taxation or otherwise, would put them out of business or would violate their obligations, would create a far worse state of affairs in this country than any possible burden of interest-bearing securities we have today. It is a condition and not a theory we are confronted with. I say broadly and unreservedly to this company, as your President said tonight, that I believe today the great street railway companies of this country, so far as I am familiar with them, and I know most of them, are being operated as fairly as possible under existing conditions, with due regard to the welfare of the public and the owners of the property.

Public sentiment is sometimes slow to do justice, but ultimately it is fair. This wave of socialism, of discontent toward

corporations, which has been sweeping over the country, I believe will subside. I did not have the pleasure of hearing the address of Mr. Ely yesterday. I understand he took a different view from that just expressed by me. I believe that the wave of socialism will subside, and the pendulum will swing back. It is our plain duty to do what we can to assist it in every way. How can we help it? Well, we must recognize the conditions as they are; we must treat the public fairly. We must realize that the day of over-capitalization, of fictitious capitalization, has gone by. The street railway business has passed through its experimental career, and the business has taken its place among the solid institutions of this country. Henceforth, in my judgment, the profits from street railway operation should be fair and sufficient to invite the capital necessary for their development, but not sufficient to justify any watering of the stock. Such watering as street railway companies do in the future had better be confined to a moderate sprinkling in the summer season. The balance of earnings over a fair return from operation, if any, can well be applied to necessary improvements, thus restricting fixed charges. The public sentiment in this country is undoubtedly opposed to the further granting of unrestricted perpetual franchises. It is impossible, of course, to discuss with any degree of accuracy a question of this kind in an informal talk, and I simply want to say that I believe this question is one of great seriousness as it affects the growth of the rural sections of the country, and I want to add that I believe there is somewhere a ground on this subject upon which progressive public sentiment and proper corporate management can meet in accord.

In my judgment it should be the duty of street railway companies to meet the commonwealth fairly upon the question of taxation. We should not seek to avoid or evade any fair burden, but we should fight to the uttermost any attempt upon the part of demagogues to convert taxation into confiscation. (Applause.) The one subject, above all others, that is eating into the vitals of this country today is the subject of graft; and if the present agitation, in matters corporate, should result in a correction of such abuses, the upheaval will not have been in vain. In so far as corporations are interested in aiding and abetting this system they are chargeable with severe censure; but I know that in nine cases out of ten, when corporations yield to this system it is not of their seeking or their own choosing, but a pure submission to blackmail. May the day soon come, if possible, in

this dear land of ours, when all forces will unite to eradicate this evil, and when the public will say—perhaps I am dreaming—but when the public will say, “We will elect to office no man who is a grafter,” and the corporation will say, “We on our part will tempt no man to become a grafter for our purpose, nor will we submit to blackmail.” (Applause.)

Now, my friends, if this proper recognition of public sentiment and corporate enterprise is to come about within our time, the press of this country must do their share. It has the province to record, to praise, and to criticise, and so long as it pursues these functions, stimulated by pure and sincere motives, the good it does is immeasurable, but when it, from sordid motives, or commercial instincts, or a desire to pander to popular prejudice, distorts the facts and inflames the public mind, it descends to the very lowest depths of the acts which it criticizes in us. (Applause.) All I ask, on the part of the press of the country today, is that it show the same keen appreciation of its responsibility to the public that it requires of us. (Applause.)

I said a few moments ago it was late to detain you with serious thoughts, and perhaps the whole theme of my subject can well be summed up in the remark Secretary Taft made to the International Railway Congress in Washington last spring, when he said, “Gentlemen, you must realize you cannot run these properties as you would your own private business.”

I cannot sit down without referring to one or two thoughts germane to my subject. When I was in college at Princeton twenty years ago, there was a popular song of the day entitled “In 1908,” a song long since gone where all topical songs go, but the verses told you of all the wonderful things that human progress was going to make happen in this year. One verse said,

“In a two days’ balloon  
You can fly to the moon,  
In 1908.”

The other night I had a dream that there was a new version of that song, but the title had been changed to “1988,” and three new verses had been written. The first verse told how in Chicago in 1988 the first municipal trolley car was being run, with Mayor Dunne as motorman. The second verse pictures, in beautiful language, how in July of the same year, the first three-cent car would run, an open car, and Tom Johnson was to be on the running board collecting the fares. The third verse pictured in the most glowing terms how the public would ride from Phila-

adelphia to New York for a single fare of five cents, with a transfer to the Captain's cabin in the Kaiser Wilhelm II for transportation to the old country, and I awoke, thinking I was in Utopia. (Applause.)

TOAST—Street Railway Management.

“That Man is Great Who Can Use the Brains of Others to Carry on His Work.”

Responded to by Mr. John I. Beggs, of Milwaukee, Wis.

The Toastmaster: I have no doubt that many of you are accustomed to see on the billboards, and the front pages of the magazines, sentences similar to this—“This is the beer that made Milwaukee famous.” This is a mistake; Milwaukee was not made famous by its beer. It was Beggs, of Milwaukee, that made Milwaukee famous. Notwithstanding the alleged slanderous remark made by him to my friend, Mr. McCarter. I have great pleasure in introducing Mr. John I. Beggs, of Milwaukee, who will respond to the toast, “Street Railway Management.”

Mr. Beggs: Mr. Toastmaster, Ladies and Gentlemen: I regret at this late hour that I was not endowed at birth with the gift of scattering before you the flowers of rhetoric such as we listened to with so much pleasure from our honored guest from across the border. The toast which has been assigned to me is a serious one and would take much longer to even touch upon the principal heads of it than is possible at a banquet and at an hour so late. The whole story is almost told in the caption which you will find in the designation of the toast—“That man is great who can use the brains of others to carry on his work.” We are seeing it demonstrated in the City of New York at the present time by an investigation that is going on there, that great is the banker who can use the money of others to carry on his business and float the loans of the world. (Laughter.)

No business in the world, no profession, no calling, no captain of industry in the world, is so greatly dependent upon the brains of others, as well as their physical exertions, as is the executive head of a street railway. We are under constant observation and are considered proper objects of criticism, which may be avoided in nearly every other calling. I happen to be, because of the various interests with which I am connected, President of a number of gas companies, likewise of a number of electric lighting companies. You may send your bills and your checks to our office, and you may telephone or write your complaints, and

it is not necessary that you should ever see an employe of either of this class of corporations, but the street railway manager must be represented by several thousand men who must come in personal contact with every member of every family in the community many times during the year, and with many of them almost daily. It is one of the most complex, one of the most perplexing duties that can come to any man, to take the administration of one of these large public service corporations, conducting the transportation interests of our cities and suburban districts. Few stop to think of what is involved. I saw in one of the daily papers of this city a day or two ago a half-column editorial stating that "The greatest street railway question" was how to give a seat to every passenger. That is an impossibility, and street railway men should take the position that it is as absolutely impracticable to do so as it would be for that newspaper to issue its latest edition within a period of thirty minutes.

These are practical questions. The managers of our street railway properties are confronted with the problem of how to obtain in a comparatively new industry, highly trained technical heads for the various departments, how to co-ordinate the several departments of which they are placed in charge so as to satisfactorily perform the obligations which we owe to the public. I inculcate daily, with all the emphasis with which I am possessed, the broad general principle that we are public servants; nevertheless, public servants with clearly defined and some reserved rights, one of which is the right to apply to the administration of these properties the experience of years of work and careful study in this business. I believe that when we obtain a franchise from any municipality that we assume grave responsibilities to the public, and I believe if more of our properties were administered with this view kept constantly in mind, honestly and conscientiously observed, there would be less clamor for municipal ownership. I admit I am surprised that in some cities of this country they have tolerated the service given. It is a disgrace to the business in which we are engaged. Such service should never have been tolerated. I can say conscientiously that in the cities in which I have had the responsibility of administering properties of this kind, that had I been employed, as was proposed by a prominent Mayor of one of the largest cities in this country, as the expert of that city to give to it the best service practicable under all existing conditions, I could not have served that city nearly so well as I have done, because the city

never would have responded to the repeated drafts for new capital to give that community the improved methods of transportation that are being developed from day to day and from year to year, and which we are expected constantly to respond to. It has not always been a question of over-capitalization of many of these companies which has brought about a good deal of the difficulty. It has been the repeated discarding of apparatus which was the best of its kind when put in, but which the progressiveness of the business in which we are engaged would not permit us to continue to use.

You may see on the stage in this hall the model of a car which, when put on Broadway, New York City, was the highest type of its kind. That car today is obsolete, and in its place there are running on that road cars as fine as a Pullman was a few years ago, on double trucks, with a large amount of power propelling it. The trucks ride as smooth as the smoothest trunk line in this city, and you will find in many interurban lines throughout the country today equally fine cars, with the very best roadbed and track construction, and that is one of the things that the newspapers of this country are not fair enough to honestly represent—what is being done in the progress of the street railway business and the large amount of capital being provided to displace serviceable but out-of-date equipment and appliances with those of more modern construction.

The serious problem with the progressive railway manager today is how to give safe, speedy transit, with a fair amount of comfort. No man with an intimate knowledge of the business would attempt to provide a seat for every passenger at the two congested periods of the day, and our friends of the newspapers forget to take into account, or choose to ignore the fact, that the time when the straps come into requisition is not much more than ten percent daily of the time that the car is running on the road and doing business. They forget to bring to your attention the fact that in nearly every community the trend of travel is toward the center from early morning until 5 or 5:30 o'clock in the evening, and then every member of the community thinks he ought to get a seat, and that they should all be able to get home within about thirty minutes, which is a physical impossibility, and one of the serious problems we are contending with, among many others. It is that which gives us the greatest amount of concern. I had occasion to address one of the municipal bodies of the country within the past few weeks. There was

an ordinance pending—and this is only a fair sample of what we are contending with all over the country—and I was appearing before a committee of that legislative body to give reasons why it was practically impossible of enforcement, and if enacted into a law I stated that I would make no attempt to enforce it. The proposed ordinance sought to impose a fine on us for permitting a passenger to stand upon the platforms of the cars. I said, "Why, gentlemen, in order to give force to your proposed ordinance, why do you not enlarge it to some extent—make the fine apply to passengers who stand on the platform? If you will thus divide the responsibility I will put it into effect." These are the serious questions, gentlemen, that confront us.

Our good friend, Mr. McCarter, did not tell the story about his visit to Milwaukee exactly as he might have told it. I think that I told him that if there was as good a street railway executive officer outside of the City of Milwaukee, that it might be the head of the Public Service Corporation of the great State of New Jersey.

I thank you, ladies and gentlemen, for the kind attention you have given to these few, plain words upon a very difficult and troublesome problem. (Applause.)

TOAST—The Trolley.

"Sing who will of Orpheus' Lyre,  
Ours the Wonder-working Wire."

Responded to by Gen. Eugene Griffin.

The Toastmaster: There is a guest present with us this evening, whom I have no doubt many times in the past you have been very anxious to see, but were unable to do so. He remains in the background, and sends representatives to your office. They make all kinds of promises about delivery and efficiency. You know all about the promises, some are kept—and I am inclined to think some are not. I cannot explain it, but we have a gentleman here this evening who should be able to do so. I now have the pleasure of introducing to you General Engene Griffin, who will undoubtedly take great pleasure in explaining why the promises are not kept and why the generators do not generate as much as is claimed for them. General Griffin will respond to the toast, "The Trolley."

General Griffin: Mr. Toastmaster, Ladies and Gentlemen: I understood that I was to speak on the subject of the trolley. If I should undertake to answer the questions your chairman

has asked, I am afraid this company would be detained beyond reason. I am glad that he acknowledged that some of our promises are kept. I think it is a fair statement that no one is ever able to keep all the promises that are made, especially when the promises are made by subordinates. Mr. Beggs has acknowledged that even on his model road, being responsible for his subordinates, he receives many complaints from his customers. It is only a question of degree, and if the percentage of promises made that are kept is large enough, I think all should be satisfied; and I assert positively that we keep a very large proportion of our promises.

On the page on which the toasts are placed, I find, as has been already noticed, hanging on the trolley poles, a sign marked "Fast." I think that is a mistake, Mr. Chairman. I think we have had a feast. I think the dinner we have consumed and the speeches we have listened to tonight can much better be designated as a feast than a fast. (Applause.)

You have spoken of the great improvement in the transportation facilities. We have on the menu cover the picture of a car which is to run from New York to San Francisco. This means trolley dining cars, for you must feed the passengers if you take them from New York to San Francisco. I remember when a rather small boy, twenty-seven years ago, down in Southern Colorado and New Mexico, the only facilities we had for securing food when traveling were the eating houses along the line. There were no dining cars. These restaurants were good but there was a sameness about them. In the early days a man named Harvey had the contract for all of the eating houses along the Atchison road. They were all run on the same general lines. It happened that a passenger stopped in the morning for breakfast and on entering the restaurant was addressed briskly by a waitress with a napkin over her arm, who said: "Ham and eggs, beef-steak and fish." He took fish. When he stopped for lunch apparently the same girl attended him with the same formula—"Ham and eggs, beef-steak and fish." He took ham and eggs, paid his bill and departed. As he drew up to the station for dinner he found the same conditions; the same room; the same girl, the same formula "Ham and eggs, beef-steak and fish." He took beef-steak, the only article remaining on the bill of fare, paid his account and departed. At breakfast the following morning he found the same conditions still unchanged. The same waitress plied him with the same question—"Ham

and eggs, beef-steak and fish?" The passenger regarded her sorrowfully and said—"The Ephesians ate, too." She said, "What?" He repeated, "The Ephesians ate, too." She drew back in alarm and complained to the superintendent that the man was crazy. "I asked him what he wanted for breakfast," she said, and he replied 'The Ephesians ate, too.'" She did not know what he meant. The superintendent was wise, and after a long search he discovered a Bible, and turning to the book of Ephesians, eighth chapter and second verse, this is what he read: "Jesus Christ, the same yesterday, today and forever."

I hope no one will take this story as sacrilegious in any sense, because it has a moral. We recognize that in the spiritual world the fundamental facts are immutable, but in the physical world not so. We all clamor for improvement. What is satisfactory today is not satisfactory tomorrow, and what will be satisfactory tomorrow will not be satisfactory thereafter. The over-running trolley of Vanderpoele had to give way to the underrunning trolley, and that in turn had to give way to the plow and conduit and the sliding trolley on the third rail. In time the sliding trolley will give way to the upward pressing trolley on the third rail and the improvements which are going on will continue forever.

I shall not say much about the trolley, because I had instructions from Mr. Ely to say nothing about the trolley, and to say very little, anyhow.

A while ago the orchestra was playing "Tammany." I do not know whether any of you have ever thought of the great difference betweeen the beginning and ending of a train of thought which starting from one station, ultimately lands you at a completely foreign station by a logical and continuous track. "Tammany" caused me to think of the musical farce "Fantana," in which it occurs; Fantana caused me to think of New York where it is being played; New York caused me to think of the conditions which exist in the summer season when the poor street railway and other managers are perspiring at their work at home while their wives and daughters are enjoying the breezes of the mountains and the seashore; and that brought to my mind a poem which I will repeat. I do not approve the sentiment involved in these lines, but I repeat them because they well express the conditions which too often prevail:

His wife is back—  
No more at night  
When to him seems the town—  
    all dull and gray—a weary sight,  
May he go forth, with paint,  
    to make it bright?  
He's had his day.  
His wife is back.

But who is that,  
With tilted hat, and  
Step as springy as the step of fawn?  
Who goes by night returning  
    with the dawn?  
It is the other man—  
Whose wife has gone.  
He'll have the fun,  
He'll see the painting done—  
The town shall no more stay  
    all dull and gray.  
His wife has gone.

Thus gentle nature makes  
    a compensation sweet;  
She gives for what she takes  
    and it is meet—  
As, when a flower is plucked  
    another springs,  
So she,—providing for a  
    myriad things  
The town is never left to stay  
    all dull and gray—  
One wife comes back—  
Another—goes away.

Mr. Toastmaster, I read some years ago of a clergyman, who electrified his audience by a most thrilling oratorical effort. In discussing the sermon one of the enthusiasts said that what specially pleased him was that the preacher had said so much that was new and so much that was true. A worldly-wise old deacon agreed with the enthusiast but added this caustic criticism: "All

he said that was new was not true, and all he said that was true was not new." I am afraid that this criticism applies to most public speakers. I fear therefore that should I say anything on the subject of the trolley, whatever I might say that was true would not be new, and whatever I might say that was new you would think was not true; and therefore we will let the trolley slip the wire. (Applause.)

TOAST—The Ladies.

"Woman is the Sunday of Man's Life."

Responded to by Mr. James Rawle, of Philadelphia.

The Toastmaster—Gentlemen, you have heard a great deal this evening about municipal ownership, the running of a city, the management of railroads, how the President of the Association secured his third term, and came near hearing all about the trolley, but did not. Like all good things, the last toast is the best, namely, "The Ladies." A gentleman has been designated to respond to this toast who is thoroughly fit and competent to undertake the task. I have great pleasure in introducing Mr. James Rawle, of Philadelphia. (Applause.)

Mr. James Rawle—My fair Constituents, Mr. President and Gentlemen: There is very little left for me to say; Mayor Weaver dwelt considerably on this topic and it has been alluded to in every one of these charming speeches which have been made. Another year, I, who am not really a member of the Association, and who yesterday afternoon was requested to respond to the toast "To the Ladies," shall join the Association if I have to buy a railroad, and then I will see that the toast "To the Ladies" is brought up as the first subject. It now lacks eleven minutes of one o'clock, and I am sure the ladies are a little tired of hearing men speak.

It seems to me that the toast to the ladies would much better be responded to by a lady. I do not mean by an oratress, because oratresses have been rather fatal in past history. To go back some years, when Mother Eve was engaged in the first banquet she was ever at, she had the floor and when it came to the fruit course she told Adam they ought to have an apple. They ate an apple, and you know the result. They immediately were obliged to go to a dressmaker, both of them, and hence the terrible scourge and trouble which have come on men and women from dressmakers ever since. (Laughter.)

Then there was that other historical character, Helen of Troy or Albany, or somewhere else, who made a speech before the peo-

ple, I suppose, I do not remember the circumstances, but anyhow there was internecine war which occurred soon after that, and one of the Generals was killed. He was tied by the neck to a chariot and dragged around the city walls.

There was another heroine who engaged in oratorical speeches, and that was Cleopatra. She exhausted her eloquence and wound up as a snake charmer. I would not recommend the ladies to respond to the *Toast* to themselves as oratresses, but it occurs to me that when the *toast* to the ladies is offered it should not be drunk in silence standing, because that is only meant for those who have passed to the silent majority—a lighter vein should surround the *toast* to the ladies—and they should engage in conversation with the men next to them on both sides and say "How nice the dinner was" and how they were bored by the men who made the speeches. The murmur of gentle conversation would be a very dignified and agreeable incident to this *toast*.

As to the part that women play in life, we only need to look around us at any time and on any occasion to see it. Man is often poetically typified by the sun, probably because the sun is called "He," and is a surly old chap making the universe to whirl around him absorbing stray planets and anything that comes his way; while the Moon is called "She," and shines by reflected light when it pleases her—a refined, dainty light, a lover's light. Expressive of the relative parts played by the sun and moon I heard this story. There was an old darky school teacher down in the south and Rastus came one day to him and said, "Massa, which is the biggest, the Sun or the Moon?" He answered, "That is a difficult question to answer, but when I come to reflect on the subject I think the moon is the biggest. The moon has to light up the night and the sun has nothing to do but lighten up the day, when it is a very easy job." I am sure that there is in its allegorical application to women and men a solid truth in the old man's reasoning. A man by strenuous brute power may melt the earthly products and control the elements, but he often, like Phaeton, driving the horses of the sun, burns himself and scorches up countries and people. Woman's cool, soft hand and soothing speech then mitigates this desolation he has caused. Woman's instinct has in many cases among those present given the missing cue to husband and friend and made pet projects feasible.

I am sure that there are many men here tonight who would not have been present at this function if it had not been for the

women who kindly said that they would come along. Thank God that they are here tonight. I do not know how many miles they have come but I do know they are here. I have condensed what I had to say because there was not very much time left. There was an old chap named Antinous—Ah, I do not mean Antinous for he was a beauty and I do not want to tell you too much about him, because I do not want to draw your attention from the gentlemen at this board—but I mean Antaeus. He was the son of the Earth, that is the earth was his mother. There was an arrangement made between his mother and himself that every time he came in contact and talked with her he would gain ten-fold in strength. One day Hercules, a contractor of that time, who had contracts to clean the Augean stables of Philadelphia and other contracts, was told to tackle this old sport. Finally he got Antaeus and held him upside down, away from his mother and he squeezed the life out of him. If Mr. Antaeus had only been able to get back to his mother he would have regained his strength but Hercules held him up for fifteen minutes and he was done for. There is an allegory here and that is that the fate of Antaeus may await those men who are denied the needed mental and moral encouragement which we get from association with women and the wise counsels of women. You may accept that as a truth. I am an old man and well stricken in years and I have often said that if the time ever comes when I cannot look on a pretty woman with feelings of joy, I shall be willing to lay my head on a block and ask the executioner that he hit me on the head with his axe. (Laughter and applause.)

The Toastmaster—Ladies and Gentlemen: Like all good things, this banquet must come to an end. We have been treated this evening first to good things, and second to good speeches, and while it is regrettable to see the end at hand, it is, nevertheless, true, and I now declare, with regret, this dinner closed.

CONSTITUTION AND BY-LAWS OF THE AMERICAN  
STREET RAILWAY ASSOCIATION.

## CONSTITUTION.

## NAME.

I. The name of the Association shall be "The American Street Railway Association," and its office shall be at the place where the Secretary resides.

## OBJECT.

II. The object of this Association shall be the acquisition of experimental, statistical and scientific knowledge, relating to the construction, equipment and operation of street railways, and the diffusion of this knowledge among the members of this Association, with the view of increasing the accommodation of passengers, improving the service and reducing its cost; the establishment and maintenance of a spirit of fraternity among the members of the Association by social intercourse, and the encouragement of cordial and friendly relations between the roads and the public.

## MEMBERS.

III. The members of this Association shall consist of American Street Railway Companies, or lessees, or individual owners of street railways; and each member shall be entitled to one vote by a delegation presenting proper credentials.

## AMENDMENT.

IV. This Constitution may be amended by a two-thirds vote of the members present at a regular meeting, after the proposed amendment shall have been submitted, in writing, at the preceding regular meeting and a copy sent to each of the members.

## BY-LAWS.

## APPLICANTS.

I. Every applicant for membership shall signify the same, in writing, to the Secretary, enclosing the requisite fee, and shall sign the Constitution and By-Laws.

## OFFICERS AND EXECUTIVE COMMITTEE.

II. The Officers shall consist of a President, three Vice-Presidents, and five others, who shall constitute the Executive Committee, and a Secretary and Treasurer. The Executive Committee shall have the entire charge and management of the affairs

of the Association. The Officers and Executive Committee shall be elected by ballot, at each regular meeting of the Association, and shall hold office until their successor shall be elected. The duties of Secretary and Treasurer shall be performed by the same person. The Secretary and Treasurer shall not be a member of the Executive Committee.

#### DUTIES OF OFFICERS.

III. The officers of the Association shall assume their duties immediately after the close of the meeting at which they are elected; they shall hold meetings at the call of the President, or, in his absence, at the call of the Vice-Presidents, in their order, and make arrangements for carrying out the objects of the Association.

#### PRESIDENT.

IV. The President, if present, or in his absence, one of the Vice-Presidents, in their order, if present, shall preside at all meetings of the Association and of the Executive Committee.

#### TREASURER.

V. The duties of the Treasurer shall be to receive and safely keep all moneys of the Association; to keep correct accounts of the same, and pay all bills approved by the President; and he shall make an annual report to be submitted to the Association. He shall give a bond to the President in such sum, and with such sureties, as shall be approved by the Executive Committee.

#### SECRETARY.

VI. The duties of the Secretary shall be to take minutes of all proceedings of the Association and of the Executive Committee and enter them in proper books for the purpose. He shall conduct the correspondence of the Association, read minutes and notices of all meetings, and also papers and communications, if the authors wish it, and perform whatever duties may be required in the Constitution and By-Laws appertaining to his department. He shall be paid a salary, to be fixed by the Executive Committee.

#### MEETINGS.

VII. The regular meeting of the Association shall be held at such time between the fifteenth day of September and the fifteenth day of December, in each year, as the Executive Committee may decide to be best suited to the locality in which the meeting is to be held; the time to be decided on and each member of the Association notified of the selection by the first day

of March in the year in which the meeting is to be held. Special meetings may be held upon the order of the Executive Committee. Notice of every meeting shall be given by the Secretary, in a circular addressed to each member, at least thirty days before the time of meeting. Fifteen members shall constitute a quorum of any meeting.

#### ORDER OF BUSINESS. (1.)

VIII. At the regular meeting of the Association the order of business shall be:

1. The reading of the minutes of the last meeting.
2. The address of the President.
3. The report of the Executive Committee on the management of the Association during the previous year.
4. The report of the Treasurer.
5. Report of Special Committees.
6. The election of Officers.
7. The reading and discussion of papers of which notice has been given to the Secretary, at least thirty days prior to the meeting.
8. General business.

#### ORDER OF BUSINESS. (2.)

IX. At other general meetings of the Association, the order of business shall be the same, except as to the 3d, 4th and 6th clauses.

#### NOTICES.

X. The Secretary shall send notices to all members of the Association at least thirty days before each meeting, mentioning the papers to be read and any special business to be brought before the meeting.

#### EXECUTIVE COMMITTEE.

XI. The Executive Committee shall meet one hour before each meeting of the Association; and on other occasions when the President shall deem it necessary, upon such reasonable notice, specifying the business to be attended to, as the Committee shall, by vote, determine.

#### VOTING.

XII. All votes, except as herein otherwise provided, shall be *viva voce*; and in case of a tie, the presiding officer may vote.

#### NON-MEMBERS.

XIII. Any member, with the concurrence of the presiding officer, may admit a friend to each meeting of the Association; but

such person shall not take any part in the discussion, unless permitted by the meeting.

#### READING OF PAPERS.

XIV. All papers read at the meetings of the Association must relate to matters connected with the objects of the Association, and must be approved by the Executive Committee before being read, unless notice of the same shall have been previously given to the Secretary, as hereinbefore provided.

#### PAPERS, DRAWINGS AND MODELS.

XV. All papers, drawing and models submitted to the meeting of the Association shall remain the property of the owners, subject, however, to be retained by the Executive Committee for examination and use, but at the owner's risk.

#### FEES.

XVI. Members shall pay an admission fee of twenty-five dollars, and annual dues of twenty-five dollars, payable in advance. The Executive Committee shall have no power to expend, for any purpose whatever, an amount exceeding that received, as hereinbefore provided for. It shall be the duty of the members to make such returns to the Secretary as shall be required by the Executive Committee.

#### ARREARS.

XVII. No member whose annual payment shall be in arrears shall be entitled to vote.

#### WITHDRAWAL.

XVIII. Any member may retire from membership by giving written notice to that effect to the Secretary, and the payment of all annual dues to that date, but shall remain a member, and liable to the payment of annual dues until such payments are made, except as hereinafter provided.

#### EXPULSION.

XIX. A member may be expelled from the Association by ballot of two-thirds of the members voting at any regular meeting of the Association, upon the written recommendation of the Executive Committee.

#### RULES OF ORDER.

XX. All rules not provided for in these By-Laws shall be those found in Roberts' Rules of Order.

## AMENDMENT.

XXI. All propositions for adding to or altering any of these By-Laws shall be laid before the Executive Committee, which shall bring them before the next regular meeting of the Association, if it shall think fit; and it shall be the duty of the Committee to do so, on the request, in writing, of any five members of the Association.

## COPIES OF CONSTITUTION AND BY-LAWS.

XXII. Each member of the Association shall be furnished by the Secretary with a copy of the Constitution and By-Laws of the Association, and also a list of the members.

CONSTITUTION AND BY-LAWS  
of the  
AMERICAN STREET AND INTERURBAN RAILWAY  
ASSOCIATION.

CONSTITUTION.

Name and Location.

I. a. The name of the Association shall be the "American Street and Interurban Railway Association."

b. The headquarters of the Association shall be located in the City of New York.

Objects.

II. The objects of the Association shall be as follows:

a. The discussion and recommendation of methods of construction, management and operation of street and interurban railways, and of safeguarding the interests of the same.

b. The establishment and maintenance of a spirit of co-operation among the members, and the encouragement of friendly relations between the companies and the public.

c. The acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of street and interurban railways and the diffusion of this knowledge among the members.

Members.

III. The membership of this Association shall consist of two classes, as follows:

a. Active Members, consisting of American street and interurban railway companies, or lessees, or individual owners of street and interurban railways. Each member shall be entitled to one vote, which shall be cast by the properly accredited delegate.

b. Associate Members, consisting of individuals, co-partnerships and corporations, who are actively identified with street and interurban railway interests, and other persons who in the opinion of the Executive Committee have had experience of such a nature as to render desirable their connection with the Association. The privileges of the associate members shall be similar to those of the active members excepting that they shall

not be entitled to vote or hold office, nor shall they have the privileges of the floor unless permitted by the Association.

Amendment.

IV. This Constitution may be amended by a two-thirds vote of the members present at a regular meeting, provided the proposed amendment shall have the approval of two-thirds of the Executive Committee, and provided that a copy shall have been sent to each of the active members at least thirty days prior to the date of the meeting at which the proposed amendment is to be acted upon.

BY-LAWS.

Elction of Members.

I. Every applicant shall signify his desire to the Secretary, enclosing the requisite fee. All applications for membership shall be referred to the Executive Committee, a two-thirds vote of the members of the Executive Committee by ballot being necessary to election. In case of rejection the membership fee shall be returned. The Executive Committee shall report at each meeting the names of new members elected.

Officers.

II. a. The officers shall consist of a President, Vice-Presidents equal in number to the number of affiliated associations, a Treasurer and a Secretary. The officers shall assume their duties immediately after the meeting at which they are elected.

b. The President and Vice-Presidents of the Association shall be elected at the Annual Meeting of the Association. All such elections shall be by ballot, and a majority of the votes of all the members present shall be necessary to an election. The Secreatry and Treasurer shall be appointed by the Executive Committee. The offices of Secretary and Treasurer may be held by one and the same person; and the work of the Treasurer's office shall be performed in the Secretary's office.

III. The President shall be the chief executive officer of the Association. He shall preside at the meetings of the Association and of the Executive Committee. In the absence of the President any duties devolving upon him may be performed by one of the Vice-Presidents.

Treasurer.

IV. The duties of the Treasurer shall be to receive, safely keep and account for all moneys of the Association; to keep cor-

rect accounts of the same, and to pay all bills approved by the President. He shall make an annual report to be submitted to the Association. He shall give bond to the President in such sum, and with such sureties, as shall be approved by the Executive Committee. He shall be paid a salary fixed by the Executive Committee.

**Secretary.**

V. The duties of the Secretary shall be as follows:

- a. To take minutes of all proceedings of the Association and of the Executive Committee and to enter them in books proper for the purpose.
- b. To conduct the correspondence of the Association.
- c. To read minutes and notices at all meetings and to present papers and communications if the authors wish it.
- d. To collect and file for the benefit of the members information and statistics regarding matters relating to the purposes of the Association.
- e. To receive applications for membership and to lay such before the Executive Committee.
- f. To attend to the publication of the proceedings of this Association; and, in conjunction with the Secretaries of the affiliated associations, to the publication of the proceedings of such affiliated associations.
- g. To send notices to all members of the Association at least thirty days before each meeting, mentioning papers to be read and any special business to be brought before the meeting.
- h. To perform such other duties as may be required of him by the Constitution and By-Laws, and such duties as may be assigned him by the Executive Committee.

The office of the Secretary shall be maintained at the headquarters of the Association. He shall be paid a salary fixed by the Executive Committee.

**The Executive Committee.**

VI. a. The entire charge and management of the affairs of the Association shall be in the hands of an Executive Committee, which shall consist of the President, the Vice-Presidents, and one member appointed by each of the affiliated associations. The Executive Committee shall make arrangements for carrying out the objects of the Association.

b. The Executive Committee shall hold a regular meeting before each regular annual meeting of the Association, and shall hold such special meetings as may be necessary. Such

special meetings may be called by the President or by any five members of the Executive Committee. A majority of the members of the Executive Committee shall constitute a quorum at all meetings.

The Secretary shall give such reasonable notice of all meetings as the committee shall by vote prescribe, and all such notices shall, as far as practicable, specify the business to be brought to the attention of the committee at such meetings.

c. The Executive Committee may assign to its allied association, the American Street Railway Manufacturers' Association, the management of the exhibit features of the annual conventions, and it may arrange with the said Manufacturers' Association the details of such entertainments as may be given in connection with the annual conventions of this Association.

d. The Executive Committee shall present a report to each regular annual meeting of the Association, and shall include in such report the names of members elected during the year, and its recommendations for the future work of the Association.

#### Meetings.

VII. a. Regular annual meetings of the Associations shall be held at such time between the fifteenth day of September and the fifteenth day of December, in each year, as the Executive Committee may decide to be best suited to the locality in which the meeting is to be held; the time to be decided upon and each member notified of the selection by the first day of May in the year in which the meeting is to be held. Special meetings may be held upon the order of the Executive Committee. Notice of every meeting shall be given by the Secretary, in a circular addressed to each member, at least thirty days before the time of the meeting. Fifteen members shall constitute a quorum at any meeting.

b. At all meetings of the Association discussion shall be limited to active members; provided, however, that special privileges may be accorded others at the will of the meeting.

c. At any regular or special meeting, executive sessions may be held. Such sessions shall be open to active members only.

#### Order of Business.

VIII. The regular order of business shall be:

1. Reading of minutes of last meeting.
2. Report of the Executive Committee.
3. Address of the President.

4. Report of the Treasurer.
5. Reports of Standing Committees.
6. Reports of Special Committees.
7. Reports of Affiliated Associations.
8. Reading and discussion of papers.
9. General business.
10. Election of officers.

Committee on Subjects.

IX. In order to secure continuity of work and uniformity of general purpose, a Committee on Subjects shall be appointed each year by the Executive Committee. The function of this Committee shall be to suggest topics for the work of the American Street and Interurban Railway Association and its Affiliated Associations for each year in advance.

The Committee shall consist of one member from each of the affiliated associations and a number from the American Street and Interurban Railway Association equal to the total number from the Affiliated Associations. The Committee, at each annual meeting, shall present its plans for the coming year.

Voting.

X. All votes except as herein otherwise provided for shall be *viva voce*; and in case of a tie, the presiding officer shall vote.

Reading of Papers.

XI. All papers read at the meetings of the Association must relate to matters connected with the objects of the Association and must have been previously approved by the Executive Committee.

Affiliated Associations.

XII. This Association shall do all in its power to promote the welfare of other associations organized with its approval to investigate technical matters connected with street and interurban railway construction and operation. To this end it will, in the following ways, and in others which may be determined by the Executive Committee, assist in the work of such Affiliated Associations:

- a. By authorizing the formation and approving the constitutions of such associations.
- b. By admitting to the Executive Committee a member from each of such associations.
- c. By granting financial assistance to such associations.

d. By editing, printing and binding the reports of the proceedings of such associations.

e. Through its Secretary and Committees it will assist in arranging for conventions, suggesting suitable subjects for investigation; it will file information for reference and distribution and in every way endeavor to stimulate interest in all of the Affiliated Associations.

Papers, Drawings, Etc.

XIII. All papers, drawings and models submitted to the meetings of the Association shall remain the property of the owners; subject, however, to retention by the Executive Committee for examination and use, but at the owner's risk.

Fees.

XIV. Active members shall pay an admission fee of ten dollars and annual dues payable in advance based on gross earnings from railway operation during the preceding fiscal year of the respective companies, as follows:

	GROSS RECEIPTS	Annual Dues
Under	\$50,000 .....	\$15.00
Between	50,000 and 100,000 .....	25.00
"	100,000 " 250,000 .....	50.00
"	250,000 " 500,000 .....	75.00
"	500,000 " 1,000,000 .....	100.00
"	1,000,000 " 2,000,000 .....	150.00
"	2,000,000 " 3,000,000 .....	200.00
"	3,000,000 " 4,000,000 .....	250.00
"	4,000,000 " 5,000,000 .....	300.00
"	5,000,000 " 6,000,000 .....	350.00
"	6,000,000 " 7,000,000 .....	400.00
"	7,000,000 " 8,000,000 .....	450.00
"	8,000,000 " 9,000,000 .....	500.00
"	9,000,000 " 10,000,000 .....	550.00
	10,000,000 " over .....	600.00

Associate members shall pay in advance an annual fee of five dollars.

Arrears.

XV. No member whose annual payment shall be in arrears shall be entitled to vote.

**Withdrawal.**

XVI. Any member may retire from membership by giving written notice to that effect to the Secretary, and by the payment of all annual dues to that date, but shall remain a member and liable to the payment of annual dues until such payments are made, except as hereinafter provided.

**Expulsion.**

XVII. A member may be expelled from this Association by the vote of two-thirds of the members present at any regular meeting of the Association, upon the written recommendation of the Executive Committee.

**Rules of Order.**

XVIII. All rules not provided for in these By-Laws shall be those found in Roberts' Rules of Order.

**Amendments.**

XIX. All propositions for adding to or altering any of these By-Laws shall be laid before the Executive Committee, which shall bring them before the next regular meeting of the Association, if it shall consider such course desirable; and it shall be the duty of the Committee to do so, on the request, in writing, of any five members of the Association.

LIST OF MEMBERS AND THEIR OFFICERS  
SEPTEMBER 30, 1905.

ARRANGED ALPHABETICALLY ACCORDING TO CITIES.

Akron, O., Northern Ohio Traction and Light Co.

Pres., H. A. Everett; 1st Vice-Pres., Will Christy; 2d Vice-Pres. and Gen. Man., Charles Currie; Sec., C. F. Moore; Treas., J. R. Nutt; Gen. Superintendent., W. H. Douglass.

Albany, N. Y., United Traction Co.

Chairman Board of Directors, Robert C. Pruyn; Pres., John W. McNamara; Vice-Pres., Francis N. Mann, Jr.; Sec., Charles G. Cleminshaw; Asst. Sec., Julia Herrick; Treas., James McCredie; Asst. Treas., Hugh J. Collins; Aud., George H. Redway; Purch. Agt., Joseph J. Hagen; Gen. Supt., Edgar S. Fassett; Div. Supt., Charles H. Smith; Elec. and Mech. Eng., Herschel A. Benedict.

Allentown, Pa., Lehigh Valley Traction Co.

Pres., Robert E. Wright; Vice-Pres., Loftin E. Johnson; Sec. and Treas., C. M. Bates; Asst. Sec. and Asst. Treas., C. M. Walter; Gen. Man., Warren S. Hall; Supt., Henry C. Barrow; Elec., R. C. Dornblaser.

Alton, Ill., Alton, Granite and St. Louis Traction Co.

Pres. and Gen. Man., Joseph F. Porter; Vice-Pres., Fred E. Allen; Sec., L. C. Haynes; Treas., Charles A. Caldwell; Aud., H. E. Weeks; Div. Supts., W. E. Porter and G. E. Mills; Elec. Supt., H. O. Channon.

Altoona, Pa., Altoona and Logan Valley Elec. Ry. Co.

Pres., J. J. Sullivan; Vice-Pres., H. J. Crowley; Sec. and Treas., Charles L. S. Tingley; Comp., Frank J. Pryor, Jr.; Gen. Man., Scott S. Crane.

Anderson, Ind., Indiana Union Traction Co.

Pres., Arthur W. Brady; 1st Vice-Pres., J. Levering Jones; 2d Vice-Pres., W. Kelsey Schoepf; Sec. and Asst. Treas., William

C. Sampson; Treas., John J. Collier; Compt., Isaac McQuilkin; Gen. Man., H. A. Nicholl; Supt. of Transportation, C. A. Baldwin; Supt. of M. P., P. J. Mitten; Elec. Eng., A. S. Richey.

Asbury Park, N. J., Atlantic Coast Elec. R. R. Co.

Receiver, James Smith, Jr.; Pres., W. E. Benjamin; Vice-Pres., Daniel O'Day; Sec. and Treas., Albert C. Twining; Aud., George B. Cade; Gen. Man., Scott F. Hazelrigg; Supt., Charles E. Hereth.

Atchison, Kan., Atchison Ry., Light and Power Co.

Pres., W. P. Waggener; Vice-Pres., J. P. Brown; Sec., James M. Chisham; Treas., C. S. Hetherington; Gen. Supt., H. N. Siegfried; Chief Elec., F. J. Roth.

Atlanta, Ga., Georgia Ry. and Elec. Co.

Pres., P. S. Arkwright; Vice-Pres., Sec. and Man. Ry. Dept., T. K. Glenn; Vice-Pres., Treas. and Man. Elec. Dept., G. W. Brine; Supt. of Transportation, H. N. Hurt; Asst. Supt. of Transportation, S. E. Simmons; Supt. of Roadways, W. H. Glenn; Purch. Agt., G. E. Graves; Ch. Eng., W. Bloxham; Mast. Mech., A. M. Moore; Elec. Eng., A. Balsley.

Augusta, Ga., Augusta Ry. and Elec. Co.

Pres., John Blair MacAfee; Vice-Pres., C. G. Goodrich; Sec., Treas. and Aud., A. J. McKnight; Gen. Supt., R. E. Hunt; Supt. of Transportation, C. L. Furbay; Ch. Eng., J. A. Wells.

Aurora, Ill., Elgin, Aurora and Southern Traction Co.

Pres., L. J. Wolf; Vice-Pres., Edwin C. Faber; Sec. and Treas., H. C. Lang; Aud., W. P. Harvey; Gen. Man., John T. Huntington.

Austin, Texas, Austin Elec. Ry. Co.

Pres., W. H. Young; Vice-Pres., F. H. Watriss; Sec. C. V. Peel; Treas., Edward P. Wilmont; Elec. Eng., J. Eggeling.

Baltimore, Md., United Rys. and Elec. Co.

Pres., J. M. Hood; 1st Vice-Pres., George C. Jenkins; 2d Vice-Pres. and Gen. Man., William A. House; Sec. and Treas., H. C. McJilton; Aud., N. E. Stubbs; Supt. of Transportation, W. C. Ludwig; Conslt. Eng., P. O. Keilholtz; Supt. Overhead Line, T. A. Cross; Ch. Eng., D. B. Banks; Supt. of Shops, H. H. Adams.

Bay City, Mich., Bay City Traction & Elec. Co.

Pres., H. D. Walbridge; 1st Vice-Pres., J. C. Weadock; 2d Vice-Pres. and Gen. Man., B. C. Cobb; Sec. and Treas., G. L. Estabrook; Aud., C. E. Mershon; Supt., W. P. Jackson.

Beaumont, Texas, Beaumont Traction Co.

Pres., Harry K. Johnson; Sec., Treas. and Man., Frank J. Duffy; Chief Eng., C. A. Rhymes.

Binghamton, N. Y., Binghamton, Ry. Co.

Pres., G. Tracy Rogers; Vice-Pres., George E. Green; Sec., John B. Rogers; Treas., H. C. Hardie; Gen. Man. and Purch. Agt., J. P. E. Clark; Ch. Eng., F. W. Summers.

Birmingham, Ala., Birmingham Ry., Light and Power Co.

Pres., Robert Jemison; Vice-Pres. and Gen. Man., James A. Emery; Sec., Joseph P. Ross; Treas. and Aud., C. M. Cory; Asst. Sec. and Asst. Treas., Elmer M. White; Mast. Mech., W. A. McWhorter.

Boston, Mass., Boston Elevated Ry. Co.

Pres., William A. Bancroft; Vice-Pres., Charles S. Sergeant; Treas., William Hooper; Aud., Henry L. Wilson; Supt. of Trans., Julius E. Rugg; Supt. of Elevated Division, H. A. Pasho; Supt. Depart. of Wires and Conduits, Charles H. Hile; Supt. of M. P. and Mach., Charles F. Baker.

Boston, Mass., Boston and Northern St. Ry. Co.

Pres., P. F. Sullivan; Vice-Pres. and Gen. Man., Robert S. Goff; Sec., Chas. Williams; Treas., J. H. Goodspeed; Aud., H. S.

Nowell; Supts., F. C. Wilkinson, Thomas Lees; Elec. Eng., Charles F. Bancroft.

Boston, Mass., Boston and Worcester St. Ry. Co.

Pres., James F. Shaw; Vice-Pres., H. Fisher Eldredge; Sec. and Treas., George A. Butman; Aud., A. E. Stone; Gen. Man., James F. Shaw; Gen. Supt., E. P. Shaw, Jr.; Elec. Eng., M. V. Ayers.

Boston, Mass., Old Colony St. Ry. Co.

Pres., P. F. Sullivan; Vice-Pres. and Gen. Man., Robert S. Goff; Sec., Charles Williams; Treas., Joseph H. Goodspeed; Aud., D. Dana Bartlett; Gen. Supt., George F. Seibel; Asst. Supt., J. T. Conway; Elec. Eng., Charles F. Bancroft.

Bridgeport, Conn., Connecticut Ry. and Lighting Co.

Pres., A. M. Young; Vice-Pres., D. S. Plume; Sec., W. F. Doulhirt; Treas., Lewis Lillie; Asst. Sec. and Treas., E. W. Poole; Aud., C. F. Bryant; Man. Dir., Walton Clark; Gen. Man., John E. Sewell; Gen. Supt., William Darbee; Elec. Supt., W. T. Oviatt.

Bridgeton, N. J., Bridgeton and Millville Traction Co.

Pres., J. J. Sullivan; Vice-Pres., Henry J. Crowley; Sec. and Treas., Charles L. S. Tingley; Compt., Frank J. Pryor, Jr.; Gen. Man., B. Frank Hires; Chief Eng., C. F. W. Myers.

Buffalo, N. Y., International Ry. Co.

Pres., Henry J. Pierce; Vice-Pres., Nelson Robinson; Sec. and Treas., J. F. Slocum; Asst. Treas. G. H. Whitnell; Aud., A. C. Emmerick; Gen. Man., T. W. Wilson; Claim Agent, A. J. Farrell; Elec. Eng., George A. Harvey.

Butte, Mont., Butte Elec. Ry. Co.

Pres., William A. Clark; Vice-Pres., Jas. A. MacDonald; Sec. and Treas., Pierre V. C. Miller; Gen. Man., Jesse R. Wharton; Supt., Jesse S. Wathey; Chief. Elec., Frank McTucker.

Camden, N. J., Public Service Corporation of N. J. (So. Jersey Div.)

Pres., Thomas N. McCarter; 4th Vice-Pres., John J. Burleigh; Gen. Aud., J. R. Shurtz; Aud., Samuel T. Corliss; Gen. Supt., W. E. Harrington.

Canton, O., Canton-Akron Ry. Co.

Pres., W. H. Hoover; Vice-Pres. and Sec., Chauncey Eldridge; Treas., P. L. Saltonstall; Aud., W. Goldthwaite; Gen. Man., E. S. Dimmock; Gen. Supt., Edgar J. Rauch; Ch. Eng., J. B. Anderson; Mast. Mech., C. A. Page.

Cedar Rapids, Ia., Cedar Rapids and Iowa City Ry. and Light Co.

Pres. and Gen. Man., William G. Dows; Vice-Pres., N. M. Hubbard, Jr.; Sec. and Treas., Isaac B. Smith.

Charleston, S. C., Charleston Consolidated Ry., Gas and Elec. Co.

Pres., Philip H. Gadsden; Sec. and Aud., Pinckney J. Balaguer; Supt. Ry. Div., Theodore W. Passailaigue; Elec., Wallace W. Fuller.

Chattanooga, Tenn., Rapid Transit Co. of Chattanooga.

Pres., R. H. Koch; Vice-Pres., H. O. Richardson; Sec. and Treas., J. W. Pittock; Gen. Man., H. W. King; Supt., William McDaniel.

Chester, Pa., Chester Traction Co.

Pres., John A. Rigg; Vice-Pres., Remi Remount; Sec. and Treas., T. W. Grookett, Jr.; Aud., W. S. Bell; Gen. Man., S. S. Hoff; Supt., C. V. Mills.

Chicago, Ill., Calumet Elec. St. Ry. Co.

Pres., John Farson; Sec., Treas. and Aud., E. E. Simmons; Gen. Man., H. M. Sloan; Supt., Harry F. Hurling; Chief Eng., J. D. Savery.

## Chicago, Ill., Chicago City Ry. Co.

Pres., T. E. Mitten; 1st Vice-Pres., Lawrence A. Young; 2d Vice-Pres., A. W. Goodrich; Sec. and Aud., C. N. Duffy; Treas., T. C. Penington; Gen. Man., Mason B. Starring; Asst. to Gen. Man., E. R. Gilbert; Ch. Eng., W. H. Leland; Mast. Mech., F. A. Faut; Supt. of Way and Building, H. B. Fleming.

## Chicago, Ill., Chicago Consolidated Traction Co.

Pres. and Gen. Man., John M. Roach; Vice-Presidents, Edwin S. Hartwell and Harry F. Keegan; Sec. and Treas., C. F. Marlow; Asst. Sec. and Aud., F. E. Smith; Gen. Supt., John J. Linden; Supt., William E. Helm; Chief Elec. J. Z. Murphy.

## Chicago, Ill., Chicago Union Traction Co.

Pres. and Gen. Man., John M. Roach; Vice-Presidents, R. A. C. Smith and Walter H. Wilson; Sec. and Asst. Treas., Markham B. Orde; Treas., James H. Eckels; Aud., F. E. Smith; Gen. Supt., Robert R. Hertzog; Supt., Benjamin Phillips and Henry L. Beach; Chief Elec. J. Z. Murphy.

## Chicago, Ill., Northwestern Elevated R. R. Co.

Pres., Clarence Buckingham; Vice-Pres., Walter B. Smith; Sec. and Treas., William V. Griffin; Aud., Robert H. Williams; Gen. Supt., E. C. Noe; Supt., Robert B. Stearns.

## Chicago, Ill., South Chicago City Ry. Co.

Pres., Dwight F. Cameron; Vice-Pres., D. M. Cummings; Sec., Treas. and Purch. Agt., O. S. Gaither; Aud., William R. Gaither; Gen. Mgr., Geo. R. Folds; Supt., William Walmsley.

## Cincinnati, O., Cincinnati Traction Co.

Pres. and Gen. Man. W. Kelsay Schoepf; Vice-President, J. B. Foraker, Jr.; 2d Vice-Pres. and Gen. Man., Dana Stevens; Sec., S. C. Cooper; Treas., A. L. Kasemeier; Aud., C. F. Callaway; Gen. Supt., Robert E. Lee; Ch. Eng., Thomas Elliott; Elec., H. C. Genrich.

## Cleveland, O., Cleveland Elec. Ry. Co.

Pres., Horace E. Andrews; Vice-Pres., C. F. Emery; Sec., Henry J. Davies; Treas., George S. Russell; Asst. Treas., John Ehrhardt; Aud., William G. McDole; Gen. Man., John J. Stanley; Supts., A. E. Doty and G. L. Radcliffe; Chief Eng., E. J. Cook; Eng. M. of W., C. H. Clark.

## Cleveland, O., Cleveland and Southwestern Traction Co.

Pres., F. T. Pomeroy; Vice-Pres., A. E. Akins; Sec., E. F. Schneider; Treas., F. L. Fuller; Aud., H. B. Cavanaugh; Gen. Man., H. A. Nicholl; Supt. of Western Div., J. A. Nester; Supt. of Southern Div., G. E. Phelps; Ch. Eng., E. G. Hindert; Line Foreman, William Demline; Mast. Mech., F. A. Strail.

## Cleveland, O., Cleveland, Painesville and Eastern R. R. Co.

Pres., Charles W. Wason; Vice-Pres., J. A. Beidler; Sec., Fred S. Borton; Treas., Charles A. Post; Supt., Joseph Jordan.

## Cleveland, O., Eastern Ohio Traction Co.

Receiver, George T. Bishop; Gen. Man., Robert D. Beatty; Aud., George Hendrickson; Chief Eng., E. C. Stakes.

## Cleveland, O., Lake Shore Elec. Ry. Co.

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Pres., T. Ahearn; Vice-Pres., Peter Whalen; Sec. and Treas., James D. Fraser; Aud., Redmond Quain; Supt., J. E. Hutcheson; Elec. Eng., John Murphy.

Philadelphia, Pa., Holmesburg, Tacony and Frankford Elec. Ry. Co.

Pres., John A. Rigg; Vice-Pres., Remi Remont; Sec. and Treas., Thomas W. Grookett, Jr.; Gen. Supt., Henry Glazier; Mast. Mech., James C. Davies.

Philadelphia, Pa., Philadelphia Rapid Transit Co.

Pres., John B. Parsons; 1st Vice-Pres., George D. Widener; 2nd Vice-Pres. and Gen. Man., Charles O. Kruger; 3rd Vice-Pres., Alexander Rennick; Sec. and Treas., R. B. Selfridge; Aud., W. J. Kelly; Gen. Supt., Walter Ellis; Supt. of Transportation, James Bricker; Chief Eng., William S. Twinning; Ch. Eng. M. P., Charles Hewitt.

Philadelphia, Pa., Philadelphia and West Chester Tr. Co.

Pres., A. M. Taylor; Vice-Pres., Wm. S. Taylor; Sec., H. H. Aikens; Treas., C. L. Rihl; Supt., W. G. Woolfolk; Ch. Eng., C. B. Fulton.

Pittsburg, Pa., Pittsburg Railway Co.

Pres., James D. Callery; 1st Vice-Pres., James H. Reed; 2nd Vice-President., S. L. Tone; Aud., C. S. Mitchell; Gen. Supt., John Murphy; Supt. P. J. Callaghan; Elec. Eng., F. Uhlenhaut, Jr.

Plymouth, Mass., Brockton and Plymouth St. Ry. Co.

Pres., James D. Thurber; Vice-Pres., Charles I. Litchfield; Treas., A. Stuart Pratt; Asst. Treas., G. E. Chase; Gen. Mans., Stone & Webster; Man., Alba H. Warren.

Pomeroy, O., Ohio River Elec. Ry. and Power Co.

Pres., Percy M. Chandler; Vice-Pres. and Gen. Man., John Blair MacAfee; Sec., J. C. Moore; Treas., Joseph T. Walmsley; Gen. Supt., I. L. Oppenheimer; Asst. Supt., J. W. Wolfe; Elec. Supt., C. E. Price.

Port Chester, N. Y., New York and Stamford Ry. Co.

Pres. and Gen. Man., S. Mellen; Vice-Pres., H. M. Kocker-sperger; Sec., J. G. Parker; Treas., A. S. May; Supt., W. E. Golden.

Portland, Me., Portland R. R. Co.

Pres., Charles F. Libby; Sec., Treas. and Gen. Man., Edward A. Newman; Elec. Supt., J. C. Estes.

Portland, Ore., Oregon Water Power and Ry. Co.

Pres. and Gen. Man., W. H. Hurlburt; Vice-Pres., J. Frank Watson; Sec., William T. Muir; Treas., Fred S. Morris; Aud., J. B. Livingston; Supt. of Operation, G. C. Fields; Elec. Supt., E. C. Morrow; Elec. and Ch. Eng., G. I. Brown.

Portland, Ore., Portland Railway Co.

Pres. and Gen. Man., F. I. Fuller; Vice-Pres., H. L. Clay; Sec., G. L. Estabrook; Treas., C. N. Huggins.

Pottsville, Pa., Pottsville Union Traction Co.

Pres., Clarence P. King; Vice-Pres., Thomas B. Prosser; Sec., William C. Pollock, Jr.; Treas., Joseph B. Hoellman; Supt., David J. Duncan.

Providence, R. I., Providence and Danielson Ry. Co.

Pres., James H. Morris; Vice-Pres. and Gen. Man., D. F. Sherman; Sec., Franklin A. Smith, Jr.; Treas., George W. Prentice; Gen. Supt., J. E. Thielsen; Elec. Supt., J. I. Stubbert.

Providence, R. I., Rhode Island Co., The

Pres., Marsden J. Perry; Vice-Pres., A. T. Potter; Sec. and Treas., Lewis Lillie; Gen. Man., Robert I. Todd.

Quincy, Ill., Quincy Horse Ry. and Carrying Co.

Pres., George F. Duncan; Sec., W. B. McKinley; Treas. and Aud., H. P. Cox; Gen. Man., H. E. Chubbuck; Supt., W. A. Martin.

Reading, Pa., United Traction Co.

Pres., John A. Rigg; Vice-Pres., Remi Remont; Sec. and Treas., Thomas W. Grookett, Jr.; Aud., William S. Bell; Gen. Supt., Samuel E. Rigg; Supt., Alvin Dunlop; Elec. Supt., C. C. Long; Master Mech., Charles E. Lenhart.

Richmond, Ind., Richmond St. and Interurban Ry. Co.

Pres., H. B. Smith; Vice-Pres., J. W. Van Dyke; Sec., C. Murdock; Treas., J. M. Lontz; Aud., W. Parry; Supt., A. Gordon; Master Mech., Charles Atkinson.

Rochester, N. Y., Rochester Ry. Co.

Pres., C. M. Clark; Vice-Pres., A. H. Harris; Sec., J. C. Collins; Treas., George L. Estabrook; Gen. Man., Richard E. Danforth; Supt., T. F. Carver; Elec. Eng., F. B. Maize.

## Rockford, Ill., Rockford and Interurban Ry. Co.

Pres., R. N. Baylies; Vice-Pres., John Farson; Sec., G. G. Olmsted; Treas., W. F. Woodruff; Aud., F. W. McAssey; Gen. Man., T. M. Ellis; Supt. of Transportation, A. S. Rykert; Mast. Mech., Samuel de Camp.

## Rockland, Me., Rockland, Thomaston and Camden St. Ry.

Pres., George E. Macomber; Vice-Pres., Sidney M. Bird; Sec., Herbert M. Heath; Treas., Augustus D. Bird; Gen. Man., Thomas Hawken; Supt., Valentine Chisholm; Ch. Eng., Chas. E. Gregory.

## Saginaw, Mich., Saginaw Valley Traction Co.

Pres., H. D. Walbridge; Vice-Pres. and Gen. Man., B. C. Cobb; Sec. and Treas., C. E. Mershon; Gen. Supt., J. Charles Young; Elec. Supt., Frank Gavagan.

## Salt Lake City, Utah, Utah Light and Ry. Co.

Pres. Joseph F. Smith; 1st Vice-Pres., John R. Winder; 2nd Vice-Pres., Joseph S. Wells; Sec. and Gen. Man., R. S. Campbell; Treas., L. S. Hill; Aud., George S. Gannett; Supt. of Ry. Service, W. P. Read; Elec. Eng., O. A. Honnold.

## San Antonio, Tex., San Antonio Traction Co.

Pres., Emerson McMillin; Vice-Pres. and Gen. Man., H. M. Littell; Sec., Treas. and Aud., Clarence Jones Thomas; Gen. Supt., J. J. King; Supt. of Transportation, T. C. Brown.

## San Diego, Cal., San Diego Elec. Ry. Co.

Pres., John D. Spreckles; Vice-Pres. and Man. Dir., William Clayton; Sec. and Treas., H. L. Titus; Aud., A. H. Kayser; Gen. Supt., B. M. Warner; Elec., H. MacNutt.

## San Francisco, Cal., United Railroads of San Francisco.

Pres., Arthur Holland; Vice-Pres., Charles Holbrook; Sec. and Comptroller, George B. Willicutt; Treas., George E. Starr; Gen. Supt., Elwood D. Hibbs; Gen. Man., George F. Chapman; Elec., S. L. Foster.

San Juan, Porto Rico, San Juan Light and Transit Co.

Pres., P. G. Gossler; Vice-Pres., F. H. Reed; Sec., H. S. Collette; Treas., R. B. Marchant; Man., C. F. Beames.

Savannah, Ga., Savannah Elec. Co.

Pres., George J. Baldwin; Vice-Pres., H. G. Bradlee; Sec., Abraham Minis; Treas., A. Stuart Pratt; Gen. Mans., Stone & Webster; Man., L. R. Nash; Ch. Eng., F. M. Yawger.

Schenectady, N. Y., Schenectady Ry. Co.

Pres., F. A. Harrington; Sec. and Treas., J. H. Aitken; Aud., Fred. Ruby; Gen. Man., E. F. Peck; Supt., E. J. Ryan; Ch. Eng., C. C. Lewis; Mast. Mech., J. G. Bauket.

Scranton, Pa., Scranton Ry. Co.

Pres., C. M. Clark; Vice-Pres., E. W. Clark, Jr.; Sec. and Treas., C. Ford Stevens; Gen. Man., Frank Silliman, Jr.

Seattle, Wash., Seattle Elec. Co.

Pres., Jacob Furth; Vice-Pres., Charles D. Wyman; Sec., George Donworth; Treas., A. S. Pratt; Asst. Treas. and Aud., Frank Dabney; Gen. Mans., Stone & Webster; Man., Howard F. Grant; Supt. of Transportation, Arthur L. Kempster; Supt., Joseph B. Lukes; Mast. Mech., A. D. Campbell.

Sheboygan, Wis., Sheboygan Light, Power and Ry. Co.

Pres., F. A. C. Perrine; Vice-Pres., W. A. Morgan; Sec., John A. Chesney; Treas. and Gen. Man., Ernest Gonzenbach; Ch. Eng., W. B. Voth; Elec. Supt., Henry J. Pagel.

Sioux City, Ia., Sioux City Traction Co.

Pres., Samuel McRoberts; Sec. and Treas., John F. Millette; Aud., J. Henry Ricker; Gen. Man., Edwin L. Kirk; Supt., J. J. Keegan; Mast. Mech., C. M. Feist; Ch. Eng., M. W. Lake.

South Bend, Ind., Indiana Ry. Co.

Pres., Arthur Kennedy; Vice-Pres. and Gen. Man., J. McM. Smith; Sec., M. P. Reed; Treas., James B. McCance; Supt. of M. P. and Repairs, H. M. Ashenfelter.

Spokane, Wash., Spokane Traction Co.,

Pres., J. P. Graves; Vice-Pres., A. L. White; Sec., C. H. Wolf; Treas., H. B. Ferris; Gen. Man., B. J. Weeks; Supt., Harry Wherland.

Spokane, Wash., Washington Water Power Co.

Pres., Henry M. Richards; 1st Vice-Pres., A. B. Campbell; 2d Vice-Pres. and Gen. Man., D. L. Huntington; Sec., H. L. Bleecker; Treas., H. E. Perks; Elec. Supt., J. B. Fisken.

Springfield, Ill., Springfield Consolidated Ry. Co.

Pres., H. D. Walbridge; Vice-Pres., Bluford Wilson; Sec. and Treas., Wm. H. Brown; Gen. Man., Emil G. Schmidt; Gen. Supt., H. H. Jones; Elec. Supt., A. V. Schroeder; Mast. Mech., F. P. McNeil.

Springfield, Mass., Springfield St. Ry. Co.

Pres., C. S. Mellen; Treas., A. S. May; Gen Supt., H. C. Page.

Springfield, O., Springfield Ry. Co.

Pres., Oscar T. Martin; Vice-Pres., Henry J. Crowley; Sec. and Treas., Charles L. S. Tingley; Aud., Frank J. Pryor, Jr.; Gen. Man., John H. Miller; Supt., E. B. Gunn; Elec., Edward Shirley.

St. Joseph, Mich., Benton Harbor and St. Joseph Elec. Ry. and Light Co.

Pres. and Treas., W. Worth Bean; Sec. and Gen. Man., W. Worth Bean, Jr.; Ch. Elec., Fred Crane.

St. Joseph, Mo., St. Joseph Ry., Light, Heat and Power Co.

Pres., John Donovan; Vice-Pres. and Gen. Man., J. H. Van Brunt; Sec. and Treas., G. L. Estabrook; Gen. Supt., C. F. Hewitt; Supt., O. L. Bocock.

## St. Louis, Co., St. Louis and Suburban Ry. Co.

Pres., Julius S. Walsh; Vice-Pres. and Gen. Man., Julius S. Walsh, Jr.; Sec. and Treas., E. P. Sommers; Gen. Supt., John Mahoney; Elec. Supt., John A. Kreis, Jr.

## St. Louis, Mo., United Railways Co. of St. Louis.

Pres., John I. Beggs; Vice-Pres. and Gen. Man., Robert McCulloch; Sec. and Treas., James Adkins; Aud., Frank R. Henry; Asst. Gen. Man., Richard McCulloch; Master Mech., M. O'Brien.

## Steubenville, O., Steubenville Traction and Light Co.

Pres., Morris W. Stroud; Sec., W. McD. Miller; Gen. Man., J. Charles Ross; Gen. Supt., J. F. Flood; Ch. Eng., Henry Jackson

## Syracuse, N. Y., Syracuse Rapid Transit Ry. Co.

Pres., Horace E. Andrews; Vice-Pres., J. J. Stanley; Sec. and Treas., T. H. Conderman; Aud., Joseph M. Joel; Supt., John E. Duffy; Mast. Mech., Fred Dubois; Ch. Eng., A. E. Steirly.

## Tacoma, Wash., Tacoma Ry. and Power Co.

Pres., Russell Robb; Sec., Henry R. Hayes; Treas., A. Stuart Pratt; Aud., J. S. Simpson; Gen. Mans., Stone & Webster; Man., W. S. Dimmock; Supt., C. J. Franklin; Elec. Supt., Kiert Schluss.

## Tampa, Fla., Tampa Elec. Co.

Pres., George J. Baldwin; Vice-Pres., Peter O. Knight; Treas., A. Stuart Pratt; Sec., H. R. Hayes; Gen. Mans., Stone & Webster; Local Mgr., George W. Wells; Supt. Ry. Dept., G. A. Webb; Ch. Eng., H. A. Hampton.

## Terre Haute, Ind., Terre Haute Traction and Light Co.

Pres., W. R. McKeen; Vice-Pres., C. D. Wyman; Sec., H. R. Hayes; Treas., A. Stuart Pratt; Man., Gardner F. Wells; Supt., Morris M. Nash; Ch. Eng., H. E. Smith.

## Toledo, O., Toledo Railways and Light Co.

Pres., H. A. Everett; Vice-Pres. and Gen. Mgr., L. E. Beilstein; Sec. and Aud., H. S. Swift; Treas., S. D. Carr; Supt. John F. Collins; Ch. Eng., J. T. Ross.

## Topeka, Kan., Topeka Ry. Co.

Pres., E. W. Wilson; Vice-Pres., L. E. Myers; Sec. and Treas., F. G. Kelley; Aud., E. C. Flower; Supt., A. M. Patton; Ch. Eng., C. H. McCahn.

## Toronto, Ont., Toronto Ry. Co.

Pres., William MacKenzie; Vice-Pres., Frederic Nicholls; Sec. and Treas., James C. Grace; Compt., J. M. Smith; Man., R. J. Fleming; Supt., James Gunn; Ch. Eng., T. Tushingham.

## Trenton, N. J., Trenton St. Ry. Co.

Pres., John A. Rigg; Vice-Pres., Remi Remont; Sec. and Treas., Thomas W. Gookett, Jr.; Aud., William S. Bell; Gen. Man., Peter E. Hurley.

## Utica, N. Y., Utica and Mohawk Valley Ry. Co.

Pres., Horace E. Andrews; 1st Vice-Pres., John J. Stanley; 2d Vice-Pres., Alden M. Young; Sec., Walter N. Kernan; Treas., Charles B. Rogers; Gen. Man., C. Loomis Allen; Elec. Supt., William J. Harvie.

## Washington, D. C., Capital Traction Co.

Pres., George T. Dunlop; Vice-Pres., Charles C. Glover; Sec. and Treas., Charles M. Koones; Supt. and Chief Eng., David S. Carll; Elec., J. H. Hanna.

## Washington, D. C., Washington Ry. and Elec. Co.

Pres., Allan L. McDermott; Vice-Pres., George H. Harries; Sec., James B. Lackey; Treas. and Compt., William F. Ham; Gen. Man., H. W. Fuller; Ch. Eng., L. E. Sinclair; Mast. Mech., Gordon Campbell; Eng. M. of W., C. S. Kimball.

Webb City, Mo., Southwest Missouri Elec. Ry. Co.

Pres., Treas. and Gen. Man., A. H. Rogers; Vice-Pres., E. Z. Wallower; Sec., A. G. Knisley; Aud., W. E. McMeechan; Elec. Eng., E. J. Pratt.

Wellston, Mo., St. Louis, St. Charles and Western R. R.

Pres. and Treas., J. B. C. Lucas; Vice-Pres., J. J. Broderick; Sec., J. D. Houseman.

Wheeling, W. Va., Wheeling and Elm Grove, R. R. Co.

Pres., Henry Schmulback; Sec., Chas. Madden; Man., L. S. Kerker; Treas., A. M. Hamilton.

Wheeling, W. Va., Wheeling Traction Co.

Pres., T. H. Conderman; 1st Vice-Pres., B. W. Peterson; 2d Vice-Pres., J. J. Holloway; Sec. and Treas., W. A. Shirley; Gen. Man., G. O. Nagle; Supt., John Marsh.

Wichita Kan., Wichita R. R. and Light Co.

Pres., George F. Duncan; Vice-Pres. and Gen. Man., Samuel L. Nelson; Sec. and Treas., Edward Woodman; Gen. Supt., W. R. Morrison; Ch. Eng., W. C. Seibold.

Wilkes-Barre, Pa., Wilkes-Barre and Wyoming Valley Traction Co.

Pres., John A. Rigg; Vice-Pres., Remi Remont; Sec. and Treas., T. W. Grookett, Jr.; Aud., William S. Bell; Gen. Supt., Thomas A. Wright; Ch. Eng., Robert Koehler.

Williamsport, Pa., Williamsport Pass. Ry. Co.

Pres., Henry W. White; Sec., Treas. and Gen. Mgr., Ernest H. Davis; Ch. Eng., George E. Wendle.

Wilmington, Del., Wilmington and Chester Traction Co.

Pres., John A. Rigg; Vice-Pres., Remi Remont; Sec. and Treas., Thomas W. Grookett, Jr.; Supt., S. S. Huff.

Worcester, Mass., Worcester Consolidated St. Ry. Co.

Pres., Francis H. Dewey; Vice-Pres., A. George Bullock; Treas., Justin W. Lester; Gen. Man., E. G. Connette; Div., Supts., Thomas A. Leach, John B. Gorman and George H. Burgess; Supt. of M. P. and Mach., E. A. Sturgis.

York, Pa., York St. Ry. Co.

Pres., William H. Lanius; Vice-Pres., Grier Hersh; Sec., George S. Schmidt; Treas., Ellis S. Lewis; Gen. Man., A. H. Heywood; Supt., Jacob H. Mellinger; Supt. of Power Station, W. H. Long; Mast. Mech., Frank D. Connelly.

Youngstown, O., Pennsylvania and Mahoning Valley Ry. Co.

Pres., Murry A. Verner; 1st Vice-Pres., James Parmelee; 2d Vice-Pres. and Gen. Man., M. E. McCaskey; Sec., John E. McVey; Treas., B. F. Miles; Chief Eng., J. M. Walker.

## LIST OF MEMBERS

SEPTEMBER 30, 1905.

Arranged Alphabetically According to States.

## ALABAMA

Birmingham..... Birmingham Ry., Light and Power Co.  
Mobile..... Mobile Light and R. R. Co.

## ARKANSAS

Eureka Springs..... Citizens' Elec. Co.  
Little Rock..... Little Rock Ry. and Elec. Co.

## CALIFORNIA

Oakland..... Oakland Traction Consolidated.  
San Diego..... San Diego Elec. Ry. Co.  
San Francisco..... United R. Rs. of San Francisco.

## CANADA

Levis..... Levis County Ry. Co.  
London..... London St. Ry. Co.  
Montreal..... Montreal St. Ry. Co.  
Ottawa..... Ottawa Elec. Ry. Co.  
Toronto..... Toronto Ry. Co.

## COLORADO

Colorado Springs... Colorado Springs and Interurban Ry. Co.  
Denver..... Denver City Tramway Co.

## CONNECTICUT

Bridgeport..... Connecticut Ry and Lighting Co.  
Hartford..... Hartford St. Ry. Co.  
New Haven..... Consolidated Ry. Co.

## DELAWARE

Wilmington..... Wilmington and Chester Traction Co.

## DISTRICT OF COLUMBIA

Washington.....	Capital Traction Co.
"      .....	Washington Ry. and Elec. Co.

## FLORIDA

Jacksonville.....	Jacksonville Elec. Co.
Tampa.....	Tampa Elec. Co.

## GEORGIA

Atlanta.....	Georgia Ry. and Elec. Co.
Augusta.....	Augusta Ry. and Elec. Co.
Columbus.....	Columbus R. R. Co.
Macon.....	Macon Ry. and Lt. Co.
Savannah.....	Savannah Elec. Co.

## ILLINOIS

Alton.....	Alton, Granite and St. Louis Traction Co.
Aurora.....	Elgin, Aurora and Southern Traction Co.
Chicago.....	Calumet Elec. St. Ry. Co.
"      .....	Chicago City Ry. Co.
"      .....	Chicago Consolidated Traction Co.
"      .....	Chicago Union Traction Co.
"      .....	Northwestern Elevated R. R. Co.
"      .....	South Chicago City Ry. Co.
Danville.....	Danville St. Ry. and Light Co.
DeKalb.....	DeKalb-Sycamore Elec. Co.
East St. Louis.....	East St. Louis and Suburban Ry. Co.
Galesburg.....	Galesburg Elec. Motor and Power Co.
Joliet.....	Chicago and Joliet Elec. Ry. Co.
La Salle.....	Illinois Valley Traction Co.
Quincy.....	Quincy Horse Ry. and Carrying Co.
Rockford.....	Rockford and Interurban Ry. Co.
Springfield.....	Springfield Consolidated Ry. Co.

## INDIANA

Anderson.....	Indiana Union Traction Co.
Evansville .....	Evansville Elec. Ry. Co.
Ft. Wayne.....	Ft. Wayne and Wabash Valley Traction Co.
Indianapolis.....	Indianapolis Traction and Terminal Co.
Lebanon.....	Indianapolis and Northwestern Traction Co.
Richmond.....	Richmond St. and Interurban Ry. Co.
South Bend.....	Indiana Ry. Co.
Terre Haute.....	Terre Haute Traction and Light Co.

## IOWA

Cedar Rapids .....	Cedar Rapids and Iowa City Ry. and Light Co.
Davenport.....	Tri-City Ry. Co.
Des Moines.....	Des Moines City Ry. Co.
Dubuque.....	Union Elec. Co.
Sioux City.....	Sioux City Traction Co.♦

## KANSAS

Atchison.....	Atchison Ry. Lt. & Pwr. Co.
Leavenworth.....	Kansas City-Western Ry. Co.
Topeka.....	Topeka Ry. Co.
Wichita.....	Wichita R. R. and Light Co.

## KENTUCKY

Lexington.....	Lexington Ry. Co.
Louisville.....	Louisville and Eastern R. R. Co.
“ .....	Louisville Ry. Co.

## LOUISIANA

New Orleans.....	New Orleans Railways Co.
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## MAINE

Kennebunkport.....	Atlantic Shore Line Ry.
Portland.....	Portland R. R. Co.
Rockland.....	Rockland, Thomaston and Camden St. Ry.

## MARYLAND

Baltimore.....United Rys. and Elec. Co.

## MASSACHUSETTS

Boston.....Boston Elevated Ry. Co.  
 ".....Boston and Northern St. Ry. Co.  
 ".....Boston and Worcester St. Ry. Co.  
 ".....Old Colony St. Ry. Co.  
 Haverhill.....Exeter, Hampton and Amesbury St. Ry. Co.  
 Maynard.....Concord, Maynard and Hudson St. Ry. Co.  
 Merrimac.....Haverhill and Amesbury St. Ry. Co.  
 New Bedford.....Union St. Ry. Co.  
 North Adams.....Hoosac Valley St. Ry. Co.  
 Plymouth.....Brockton and Plymouth St. Ry. Co.  
 Northampton.....Northampton St. Ry. Co.  
 Springfield.....Springfield St. Ry. Co.  
 Worcester.....Worcester Consolidated St. Ry. Co.  
 Fitchburg.....Fitchburg and Leominster St. Ry. Co.

## MEXICO

City of Mexico.....Mexico Elec. Tramways, Ltd.

## MICHIGAN

Bay City.....Bay City Traction and Elec. Co.  
 Detroit.....Detroit United Ry.  
 ".....Detroit, Ypsilanti, Ann Arbor and Jackson Ry.  
 ".....Rapid Ry. System  
 Grand Rapids....Grand Rapids, Grand Haven and  
     Muskegon Ry. Co.  
 ".....Grand Rapids Ry. Co.  
 Hancock.....Houghton County St. Ry. Co.  
 Holland.....Grand Rapids, Holland and Chicago Ry.  
 Kalamazoo.....Michigan Traction Co.  
 Lansing.....Lansing and Suburban Tr. Co.  
 Menominee.....Menominee and Marinette Light and Traction Co.

Saginaw..... Saginaw Valley Traction Co.  
St. Joseph..... Benton Harbor and St. Joseph Elec.  
Ry. and Light Co.

#### MINNESOTA

Duluth..... Duluth St. Ry. Co.  
Minneapolis..... Twin City Rapid Transit Co.

#### MISSISSIPPI

Jackson..... Jackson Elec. Ry., Light and Power Co.

#### MISSOURI

Kansas City..... Kansas City Elec. Ry. and Light Co.  
St. Joseph..... St. Joseph Ry., Light, Heat and Power Co.  
St. Louis..... St. Louis and Suburban Ry. Co.  
"..... United Rys. Co. of St. Louis.  
Webb City..... Southwest Missouri Elec. Ry. Co.  
Wellston..... St. Louis, St. Charles and Western R. R.

#### MONTANA

Butte..... Butte Elec. Ry. Co.  
Great Falls..... Great Falls St. Ry.

#### NEBRASKA

Omaha..... Omaha and Council Bluffs St. Ry. Co.

#### NEW JERSEY

Asbury Park..... Atlantic Coast Elec. R. R. Co.  
Bridgeton..... Bridgeton and Millville Traction Co.  
Camden..... Public Service Corporation of N. J.  
(So. Jersey Div.)  
Jersey City..... Public Service Corporation of N. J.  
Trenton..... Trenton St. Ry. Co.

## NEW YORK

Albany.....	United Traction Co.
Binghamton.....	Binghamton Ry. Co.
Buffalo.....	International Ry. Co.
Elmira.....	Elmira Water, Light and R. R. Co.
Fishkill-on-Hudson.....	Fishkill Elec. Ry. Co.
Glen Falls.....	Hudson Valley Ry Co.
New York.....	Brooklyn Rapid Transit Co.
".....	Coney Island and Brooklyn R. R. Co.
".....	New York and Port Chester R. R. Co.
".....	Interborough Rapid Transit Co.
".....	New Jersey and Hudson River Ry. and Ferry Co.
".....	New York City Ry. Co.
".....	New York and Queens County Ry. Co.
Port Chester.....	New York and Stamford Ry. Co.
Rochester.....	Rochester Ry. Co.
Schenectady.....	Schenectady Ry. Co.
Syracuse.....	Syracuse Rapid Transit Ry. Co.
Utica.....	Utica and Mohawk Valley Ry. Co.

## OHIO

Akron.....	Northern Ohio Traction and Light Co.
Canton.....	Canton-Akron Ry. Co.
Cincinnati.....	Cincinnati Traction Co.
".....	Interurban Ry. and Terminal Co.
Cleveland.....	Cleveland Elec. Ry. Co.
".....	Cleveland and Southwestern Traction Co.
".....	Cleveland, Painesville and Eastern R. R. Co.
".....	Eastern Ohio Traction Co.
".....	Lake Shore Elec. Ry. Co.
Columbus.....	Columbus Ry. and Light Co.
".....	Dayton, Springfield and Urbana Elec. Ry. Co.
Dayton.....	Dayton and Western Traction Co.
".....	People's Ry. Co.
Hamilton.....	Cincinnati, Dayton and Toledo Traction Co.
Pomeroy.....	Ohio River Elec. Ry. and Power Co.

Springfield.	Springfield Ry. Co.
Steubenville.	Steubenville Traction and Light Co.
Toledo.	Toledo Railways and Light Co.
Youngstown.	Pennsylvania and Mahoning Valley Ry. Co.

## OREGON

Portland.	Portland Ry. Co.
"	Oregon Water Power and Ry. Co.

## PENNSYLVANIA

Allentown.	Lehigh Valley Traction Co.
Altoona.	Altoona and Logan Valley Elec. Ry. Co.
Chester.	Chester Traction Co.
Connellsville.	West Penn Rys. Co.
Greensburg, Pittsburg, McKeesport and Greensburgh Ry. Co.	
Harrisburg.	Central Pennsylvania Traction Co.
Hazleton.	Lehigh Traction Co.
Johnstown.	Johnstown Pass. Ry. Co.
Lancaster.	Conestoga Traction Co.
Lebanon.	Lebanon Valley St. Ry. Co.
Norristown.	Schuylkill Valley Traction Co.
Oil City.	Venango Power and Traction Co.
Philadelphia.	Holmesburg, Tacony and Frank-
	ford Elec. Ry. Co.
"	Philadelphia Rapid Transit Co.
"	Philadelphia and West Chester Traction Co.
Pittsburg.	Pittsburg Rys. Co.
Pottsville.	Pottsville Union Traction Co.
Reading.	United Traction Co.
Scranton.	Scranton Ry. Co.
Wilkes-Barre.	Wilkes-Barre and Wyoming Valley
	Traction Co.
Williamsport.	Williamsport Pass. Ry. Co.
York.	York St. Ry. Co.

## PHILIPPINE ISLANDS

Manila.....Manila Elec. R. R. and Light Co.

## PORTO RICO

San Juan.....San Juan Light and Transit Co.

## RHODE ISLAND

Providence.....Providence and Danielson Ry. Co.  
".....Rhode Island Co.

## SOUTH CAROLINA

Charleston....Charleston Consolidated Ry., Gas and Elec. Co.

## TENNESSEE

Chattanooga.....Rapid Transit Co. of Chattanooga  
Knoxville.....Knoxville Traction Co.  
Memphis.....Memphis St. Ry. Co.  
Nashville.....Nashville Ry. and Light Co.

## TEXAS

Austin.....Austin Elec. Ry. Co.  
Beaumont.....Beaumont Traction Co.  
Dallas.....Dallas Consolidated Elec. St. Ry. Co.  
Denison.....Denison and Sherman Ry. Co.  
El Paso.....El Paso Elec. Ry. Co.  
Galveston.....Galveston City Ry. Co.  
Houston.....Houston Elec. Co.  
San Antonio.....San Antonio Traction Co.

## UTAH

Salt Lake City.....Utah Light and Ry. Co.

## VIRGINIA

Hampton.....Newport News and Old Point Ry. and Elec. Co.  
Lynchburg.....Lynchburg Traction and Light Co.  
Norfolk.....Norfolk, Portsmouth and Newport News Co.

## WASHINGTON

Seattle.....Seattle Elec. Co.  
Spokane.....Washington Water Power Co.  
".....Spokane Traction Co.  
Tacoma.....Tacoma Ry. and Power Co.

## WEST VIRGINIA

Fairmont.....Fairmont and Clarksburg Traction Co.  
Huntington.....Camden Interstate Ry. Co.  
Wheeling.....Wheeling and Elm Grove R. R. Co.  
".....Wheeling Traction Co.

## WISCONSIN

Fond du Lac.....Eastern Wisconsin Ry. and Light Co.  
Kenosha.....Kenosha Electric Ry. Co.  
Madison.....Madison Traction Co.  
Milwaukee.....Milwaukee Elec. Ry. and Light Co.  
Sheboygan.....Sheboygan Light, Power and Ry. Co.







